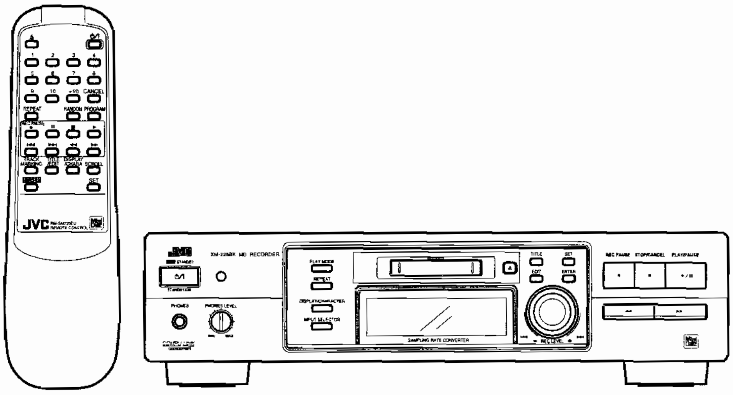
V22669

JVC

SERVICE MANUAL

MINIDISC RECORDER

XM-228BK



Area Suffix

B	U.K.
E	Continental Europe
EN	Northern Europe

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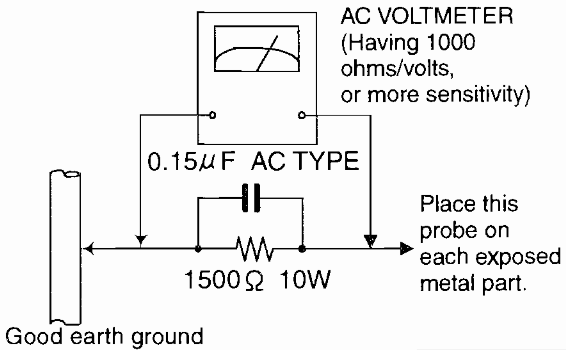
No.20721
Oct. 1998

Safety Precautions

1. This design of this product contains special hardware and many circuits and components specially for safety purposes. For continued protection, no changes should be made to the original design unless authorized in writing by the manufacturer. Replacement parts must be identical to those used in the original circuits. Services should be performed by qualified personnel only.
2. Alterations of the design or circuitry of the product should not be made. Any design alterations of the product should not be made. Any design alterations or additions will void the manufacturer's warranty and will further relieve the manufacture of responsibility for personal injury or property damage resulting therefrom.
3. Many electrical and mechanical parts in the products have special safety-related characteristics. These characteristics are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in the Parts List of Service Manual. Electrical components having such features are identified by shading on the schematics and by (⚠) on the Parts List in the Service Manual. The use of a substitute replacement which does not have the same safety characteristics as the recommended replacement parts shown in the Parts List of Service Manual may create shock, fire, or other hazards.
4. The leads in the products are routed and dressed with ties, clamps, tubings, barriers and the like to be separated from live parts, high temperature parts, moving parts and/or sharp edges for the prevention of electric shock and fire hazard. When service is required, the original lead routing and dress should be observed, and it should be confirmed that they have been returned to normal, after re-assembling.
5. Leakage current check (Electrical shock hazard testing)
   After re-assembling the product, always perform an isolation check on the exposed metal parts of the product (antenna terminals, knobs, metal cabinet, screw heads, headphone jack, control shafts, etc.) to be sure the product is safe to operate without danger of electrical shock.
   Do not use a line isolation transformer during this check.
   - Plug the AC line cord directly into the AC outlet. Using a "Leakage Current Tester", measure the leakage current from each exposed metal parts of the cabinet, particularly any exposed metal part having a return path to the chassis, to a known good earth ground. Any leakage current must not exceed 0.5mA AC (r.m.s.)
   - Alternate check method
     Plug the AC line cord directly into the AC outlet. Use an AC voltmeter having, 1,000 ohms per volt or more sensitivity in the following manner. Connect a 1,500Ω 10W resistor paralleled by a 0.15μ F AC-type capacitor between an exposed metal part and a known good earth ground.
     Measure the AC voltage across the resistor with the AC voltmeter.
     Move the resistor connection to each exposed metal part, particularly any exposed metal part having a return path to the chassis, and measure the AC voltage across the resistor. Now reverse the plug in the AC outlet and repeat each measurement voltage measured any must not exceed 0.75 V AC (r.m.s.).
     This corresponds to 0.5 mA AC (r.m.s.).


AC VOLTMETER
(Having 1000 ohms/volts, or more sensitivity)
0.15μF AC TYPE
1500Ω 10W
Place this probe on each exposed metal part.
Good earth ground

Warning

1. This equipment has been designed and manufactured to meet international safety standards.
2. It is the legal responsibility of the repairer to ensure that these safety standards are maintained.
3. Repairs must be made in accordance with the relevant safety standards.
4. It is essential that safety critical components are replaced by approved parts.
5. If mains voltage selector is provided, check setting for local voltage.

⚠ ***CAUTION*** **Burrs formed during molding may be left over on some parts of the chassis. Therefore, pay attention to such burrs in the case of preforming repair of this system.**

Safety Precautions (U.K only)

1. This design of this product contains special hardware and many circuits and components specially for safety purposes. For continued protection, no changes should be made to the original design unless authorized in writing by the manufacturer. Replacement parts must be identical to those used in the original circuits.
2. Any unauthorised design alterations or additions will void the manufacturer's guarantee ; furthermore the manufacturer cannot accept responsibility for personal injury or property damage resulting therefrom.
3. Essential safety critical components are identified by (⚠) on the Parts List and by shading on the schematics, and must never be replaced by parts other than those listed in the manual. Please note however that many electrical and mechanical parts in the product have special safety related characteristics. These characteristics are often not evident from visual inspection. Parts other than specified by the manufacturer may not have the same safety characteristics as the recommended replacement parts shown in the Parts List of the Service Manual and may create shock, fire, or other hazards.
4. The leads in the products are routed and dressed with ties, clamps, tubings, barriers and the like to be separated from live parts, high temperature parts, moving parts and/or sharp edges for the prevention of electric shock and fire hazard. When service is required, the original lead routing and dress should be observed, and it should be confirmed that they have been returned to normal, after re-assembling.

Warning

1. Service should be performed by qualified personnel only.
2. This equipment has been designed and manufactured to meet international safety standards.
3. It is the legal responsibility of the repairer to ensure that these safety standards are maintained.
4. Repairs must be made in accordance with the relevant safety standards.
5. It is essential that safety critical components are replaced by approved parts.
6. If mains voltage selector is provided, check setting for local voltage.

⚠ ***CAUTION*** **Burrs formed during molding may be left over on some parts of the chassis. Therefore, pay attention to such burrs in the case of preforming repair of this system.**

Important for Laser Products

1.CLASS 1 LASER PRODUCT

2.DANGER : Invisible laser radiation when open and inter lock failed or defeated. Avoid direct exposure to beam.

3.CAUTION : There are no serviceable parts inside the Laser Unit. Do not disassemble the Laser Unit. Replace the complete Laser Unit if it malfunctions.

4.CAUTION : The compact disc player uses invisible laserradiation and is equipped with safety switches whichprevent emission of radiation when the drawer is open and the safety interlocks have failed or are defeated. It is dangerous to defeat the safety switches.

5.CAUTION : If safety switches malfunction, the laser is able to function.

6.CAUTION : Use of controls, adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

⚠ ***CAUTION*** **Please use enough caution not to see the beam directly or touch it in case of an adjustment or operation check.**

VARNING : Osynlig laserstrålning är denna del är öppnad och spårren är urkopplad. Betrakta ej strålen.

VARO : Avattaessa ja suojalukitus ohitettaessa olet alttiina näkymättömälle lasersäteilylle.Älä katso säteeseen.

ADVARSEL : Usynlig laserstråling ved åbning , når sikkerhedsafbrydere er ude af funktion. Undgå udsættelse for stråling.

ADVARSEL : Usynlig laserstråling ved åpning,når sikkerhetsbryteren er avslott. unngå utsettelse for stråling.

REPRODUCTION AND POSITION OF LABELS

WARNING LABEL

(Except for the U.S.A)

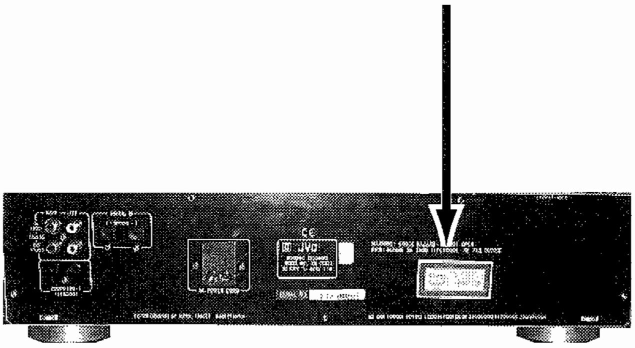
DANGER : Invisible laser radiation when open and interlock or defeated.
AVOID DIRECT EXPOSURE TO BEAM (e)

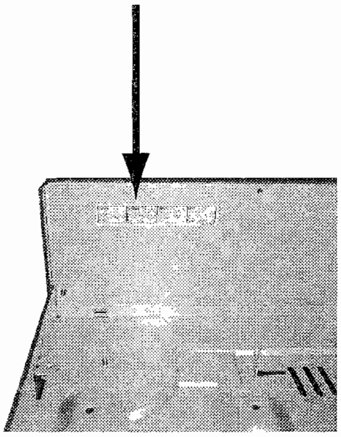
ADVARSEL :Usynlig laserstråling ved åbning , når sikkerhedsafbrydere er ude af funktion. Undgå udsættelse for stråling. (f)

VARNING : Osynlig laserstrålning är denna del är öppnad och spärren är urkopplad. Betrakta ej strålen. (s)

VARO : Avattaessa ja suojalukitus ohitettaessa olet alttiina näkymättömälle lasersäteilylle.Älä katso säteeseen. (d)

CLASS 1
LASER PRODUCT

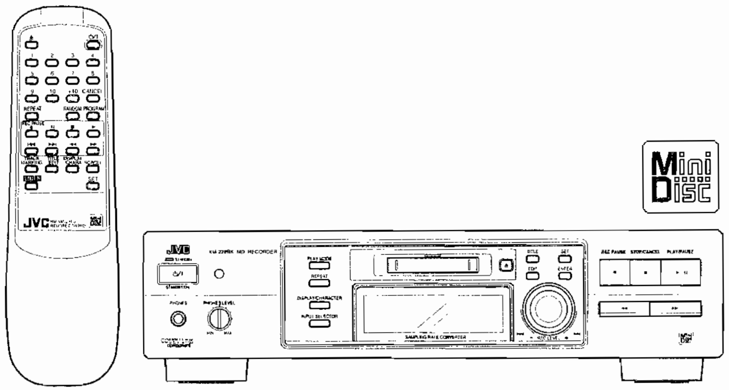




JVC

MINIDISC RECORDER
MINIDISC-REKORDER
ENREGISTREUR MINIDISC
MINIDISC-RECORDER
GRABADORA DE MINIDISC
REGISTRATORE MINIDISC

XM-228BK



INSTRUCTIONS
BEDIENUNGSANLEITUNG
MANUEL D'INSTRUCTIONS
GEBRUIKSAANWIJZING
MANUAL DE INSTRUCCIONES
ISTRUZIONI

For Customer Use:
Enter below the Model No. and Serial No. which are located either on the rear, bottom or side of the cabinet. Retain this information for future reference.

Model Nc ________

Serial No. ________

LVT0111-001B
[E]

Warnings, Cautions and Others / Warnung, Achtung und sonstige Hinweise /Mises en garde, précautions et indications diverses /Waarschuwingen, voorzorgen en andere mededelingen/ Avisos, precauciones y otras notas / Avvertenze e precauzioni da osservare

IMPORTANT for the U.K.

DO NOT cut off the mains plug from this equipment. If the plug fitted is not suitable for the power points in your home or the cable is too short to reach a power point, then obtain an appropriate safety approved extension lead or consult your dealer.

BE SURE to replace the fuse only with an identical approved type, as originally fitted.

If nontheless the mains plug is cut off ensure to remove the fuse and dispose of the plug immediately, to avoid a possible shock hazard by inadvertent connection to the mains supply.

If this product is not supplied fitted with a mains plug then follow the instructions given below:

IMPORTANT:

DO NOT make any connection to the terminal which is marked with the letter E or by the safety earth symbol or coloured green or green-and-yellow.

The wires in the mains lead on this product are coloured in accordance with the following code:

Blue : Neutral
Brown : Live

As these colours may not correspond with the coloured markings identifying the terminals in your plug proceed as follows:

The wire which is coloured blue must be connected to the terminal which is marked with the letter N or coloured black.

The wire which is coloured brown must be connected to the terminal which is marked with the letter L or coloured red.

IF IN DOUBT - CONSULT A COMPETENT ELECTRICIAN.

Caution — ⏻/I switch!
Disconnect the mains plug to shut the power off completely. The ⏻/I switch in any position does not disconnect the mains line. The power can be remote controlled.

Achtung — ⏻/I-Schalter!
Den Netzstecker aus der Steckdose ziehen, um die Stromversorgung vollkommen zu unterbrechen. Der Schalter ⏻/I unterbrichet in keiner Stellung die Stromversorgung vollkommen. Die Stromversorgung kann mit der Fernbedienung ein- und ausgeschaltet werden.

Attention — Commutateur ⏻/I!
Déconnecter la fiche de secteur pour couper complètement le courant. Le commutateur ⏻/I ne coupe jamais complètement la ligne de secteur, quelle que soit sa position. Le courant peut être télécommandé.

Voorzichtig — ⏻/I schakelaar!
Om de stroomtoevoer geheel uit te schakelen, trekt u de stekker uit het stopkontakt. Anders zal er altijd een geringe hoeveelheid stroom naar het apparaat lopen, ongeacht de stand van de ⏻/I schakelaar. U kunt het apparaat ook met de afstandsbediening aan- en uitschakelen.

Precaución — Interruptor ⏻/I!
Desconectar el cable de alimentación para desactivar la alimentación totalmente. Cualquier que sea la posición de ajuste del interruptor ⏻/I, la alimentación no es cortada completamente. La alimentación puede ser controlada remotamente.

Attenzione — L'interruttore ⏻/I!
Disinserire la spina del cavo di alimentazione dalla presa della rete elettrica per staccare completamente l'alimentazione. L'interruttore ⏻/I in nessuna posizione stacca la linea di alimentazione elettrica principale. È possibile il controllo remoto dell'alimentazione.

CAUTION
To reduce the risk of electrical shocks, fire, etc.:
1. Do not remove screws, covers or cabinet.
2. Do not expose this appliance to rain or moisture.

ACHTUNG
Zur Verhinderung von elektrischen Schlägen, Brandgefahr, usw:
1. Keine Schrauben lösen oder Abdeckungen entfernen und das Gehäuse nicht öffnen.
2. Dieses Gerät weder Regen noch Feuchtigkeit aussetzen.

ATTENTION
Afin d'éviter tout risque d'électrocution, d'incendie, etc.:
1. Ne pas enlever les vis ni les panneaux et ne pas ouvrir le coffret de l'appareil.
2. Ne pas exposer l'appareil à la pluie ni à l'humidité.

VOORZICHTIG
Ter vermindering van gevaar voor brand, elektrische schokken, enz.:
1. Verwijder geen schroeven, panelen of de behuizing.
2. Stel het toestel niet bloot aan regen of vocht.

PRECAUCIÓN
Para reducir riesgos de choques eléctricos, incendio, etc.:
1. No extraiga los tornillos, los cubiertas ni la caja.
2. No exponga este aparato a la lluvia o a la humedad.

ATTENZIONE
Per ridurre il rischio di shock elettrici, incendi, ecc...
1. Non togliete viti, coperchi o la scatola.
2. Non esponete l'apparecchio alla piogggia e all'umidità.

IMPORTANT FOR LASER PRODUCTS/ WICHTIGER HINWEIS FÜR LASER-PRODUKTE / IMPORTANT POUR LES PRODUITS LASER /BELANGRIJKE INFORMATIE VOOR LASERPRODUKTEN / IMPORTANTE PARA LOS PRODUCTOS LÁSER / IMPORTANTE PER I PRODOTTI LASER

REPRODUCTION OF LABELS/ANBRINGUNGSORTE FÜR LASER-PRODUKTE/REPRODUCTION DES ETIQUETTES/ VERKLARING VAN DE LABELS/REPRODUCCIÓN DE ETIQUETAS/RIPRODUZIONE DELLE ETICHETTE

(1) CLASSIFICATION LABEL, PLACED ON REAR ENCLOSURE

(1) KLASSIFIKATIONSETIKETTE AN DER RÜCKSEITE

(1) ETIQUETTE DE CLASSIFICATION, PLACÉE A L'ARRIÈRE DU COFFRET

(1) KLASSIFIKATIELABEL, OP DE ACHTERZIJDE VAN HET APPARAAT

(1) ETIQUETA DE CLASIFICACIÓN, PEGADA EN LA PARTE POSTERIOR DE LA CAJA

(1) ETICHETTA DI CLASSIFICAZIONE, SITUATA SUL RIVESTIMENTO POSTERIORE

(2) WARNING LABEL, PLACED INSIDE THE UNIT

(2) WARNETIKETTE IM GERÄTEINNEREN

(2) ETIQUETTE D'AVERTISSEMENT PLACÉE À L'INTERIEUR DE L'APPAREIL

(2) WAARSCHUWINGSLABEL, IN HET APPARAAT

(2) ETIQUETA DE ADVERTENCIA, PEGADA EN EL INTERIOR DE LA UNIDAD

(2) ETICHETTA DI AVVERTENZA, SITUATA ALL'INTERNO DELL'APPARECCHIO

CLASS 1
LASER PRODUCT

DANGER: Invisible laser radiation when open and interlock failed or defeated AVOID DIRECT EXPOSURE TO BEAM. (e)

VARNING: Osynlig laserstrålning når denna del är öppnad och spärren är urkopplad Betrakta ej strålen. (s)

ADVARSEL: Usynlig laserstråling ved åbning, når sikkerhedsafbrydere er ude af funktion. Undgå udsættelse for stråling (d)

VARO: Avattaessa ja suojalukitus ohitettaessa olet alttiina näkymättömälle lasersäteilylle. Älä katso säteeseen. (f)

1. CLASS 1 LASER PRODUCT
2. **DANGER**: Invisible laser radiation when open and interlock failed or defeated. Avoid direct exposure to beam.
3. **CAUTION**: Do not open the top cover. There are no user serviceable parts inside the Unit; leave all servicing to qualified service personnel.

1. LASER-PRODUKT DER KLASSE 1
2. **GEFAHR**: Unsichtbare Laserstrahlung bei Öffnung und fehlerhafter oder beschädigter Spre. Direkten Kontakt mit dem Strahl vermeiden!
3. **ACHTUNG**: Das Gehäuse nicht öffnen. Das Gerät enthält keinerlei Teile, die vom Benutzer gewartet werden können. Überlassen Sie Wartungsarbeiten bitte qualifizierten Kundendienst-Fachleuten.

1. PRODUIT LASER CLASSE 1
2. **ATTENTION:** Radiation laser invisible quand l'appareil est ouvert ou que le verrouillage est en panne ou désactivé. Eviter une exposition directe au rayon.
3. **ATTENTION:** Ne pas ouvrir le couvercle du dessus. Il n'y a aucune pièce utilisable à l'intérieur. Laisser à un personnel qualifié le soin de réparer votre appareil.

1. KLAS 1 **LASERPRODUKT**
2. **GEVAARLIJK**: Onzichtbare laserstraling wanneer open en de beveiliging faalt of uitgeschakeld is. Voorkom het direkt blootstaan aan de straal.
3. **VOORZICHTIG**: De bovenkap niet openen. Binnenin het toestel bevinden zich geen door de gebruiker te repareren onderdelen: laat onderhoud over aan bekwaam vakpersoneel.

1. PRODUCTO LASER CLASE 1
2. **PELIGRO**: En el interior hay radiación láser invisible. Evite el contacto directo con el haz.
3. **PRECAUCIÓN**: No abra la tapa superior. En el interior de la unidad no existen piezas reparables por el usuario; deje todo servicio técnico en manos de personal calificado.

1. PRODOTTO LASER CLASSE 1
2. **PERICOLO:** Radiazione laser invisibile quando l'apparecchio è aperto ed il dispositivo di sicurezza è guasto o disattivato. Evitare l'esposizione diretta ai raggi.
3. **ATTENZIONE:** Non aprire il coperchio superiore. Non vi sono parti adoperabili dall'utente all'interno di questo apparecchio; lasciare tutti i controlli a personale qualificato.

Welcome !

We would like to thank you for purchasing one of our JVC products. Before connecting this unit to the wall outlet, please read the instructions carefully to ensure that you obtain the best possible performance. If you have any questions, please consult your JVC dealer.

Important cautions

Installation of the Unit
- Select a place which is level, dry and neither too hot nor too cold (Between 5°C and 35°C or 41°F and 95°F).
- Leave sufficient distance between the Unit and a TV.
- Be sure to place the Unit in a location with good ventilation.
- Do not use the Unit in a place subject to vibrations.
- Do not place the Unit on a carpet.
- Do not place the Unit on top of another heat-generating piece of equipment.

Power cord
- Do not handle the power cord with wet hands!
- When unplugging the Unit from the wall outlet, always pull the plug, not the power cord.

Malfunctions, etc.
- There are no user serviceable parts inside. If anything goes wrong, turn off the power immediately. If the same problem reoccurs when the power is turned on once more, turn off the power again, unplug the power cord and consult your dealer.
- Do not insert any metallic object into the Unit.

For safe use, observe the following

Avoid moisture, water and dust
Do not set your machine in moist or dusty places.

Avoid high temperatures
Do not expose your machine to direct sunlight or set near a heating device.

Do not block the vents
Poor-ventilation may damage your machine. So do not block the vents or put the unit in a poorly ventilated place.

When you're away
When away on travel or otherwise for an extended period of time, turn off the power and pull the plug from the electrical socket.

Do not insert foreign matter into the machine
Do not insert wires, hairpins, coins, etc. into your machine.

Care of the cabinet
When cleaning your machine, use a soft cloth and follow the relevant instructions on the use of chemically-coated cloths. Avoid applying benzene, thinner or other organic solvents and disinfectants. This may cause deformation or discoloring.

If water gets inside the machine
Turn off the power and pull the plug from the electrical socket, then call the store where you made your purchase. Using the machine in this state may cause a fire or electrical shock.

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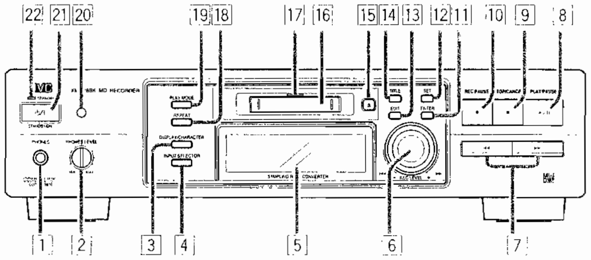
Parts Index

English

Front panel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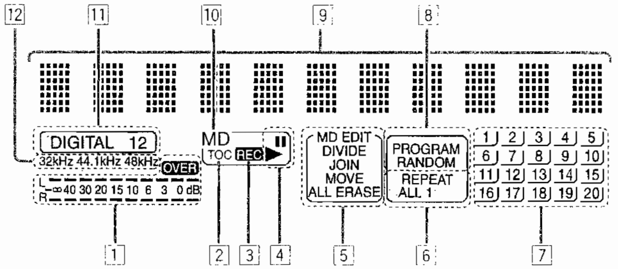
1 **PHONES** jack
2 **PHONES LEVEL** control
3 **DISPLAY/CHARACTER** button
4 **INPUT SELECTOR** button
5 Display
6 Jog dial (**◀◀, ▶▶/REC LEVEL)**
7 **◀◀, ▶▶** buttons
8 **▶/II PLAY/PAUSE** button
9 **■ STOP/CANCEL** button
10 **● REC PAUSE** button
11 **ENTER** button
12 **SET** button
13 **EDIT** button
14 **TITLE** button
15 ▲ (Eject) button
16 MD insertion slot
17 Disc indicator
18 **REPEAT** button
19 **PLAY MODE** button
20 Remote sensor
21 **⏻/I STANDBY/ON** button
22 **STANDBY** indicator

Display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11
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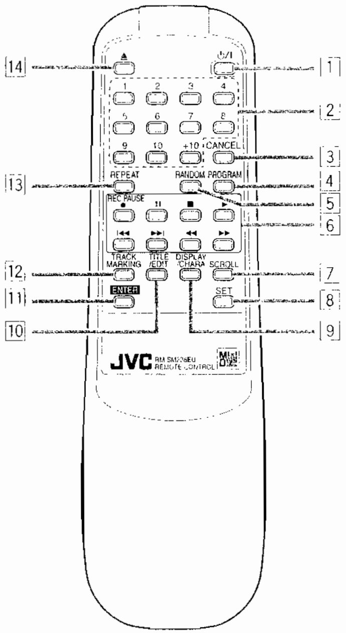
DIGITAL 12
32kHz 44.1kHz 48kHz
OVER
L
R
-∞ 40 30 20 15 10 6 3 0 dB
MD
TOC
REC
MD EDIT
DIVIDE
JOIN
MOVE
ALL ERASE
PROGRAM
RANDOM
REPEAT
ALL 1
1 2 3 4 5
6 7 8 9 10
11 12 13 14 15
16 17 18 19 20
1
2
3
4
5
6
7

1 Level indicators and OVER indicator
2 TOC indicator
3 REC indicator
4 Play indicators (▶ (Play), II (Pause))
5 MD editing mode indicators
(DIVIDE, JOIN, MOVE, ERASE, ALL ERASE)
6 Repeat mode indicators
(REPEAT ALL, REPEAT 1)
7 Music calender
8 Play mode indicators (PROGRAM, RANDOM)
9 Character display (11 digits)
10 MD indicator
11 Input mode indicators (DIGITAL 1, DIGITAL 2)
12 Sampling frequency indicators
(32KHz, 44.1kHz, 48kHz)

English

Remote control unit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⏻/I
1
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10
+10
CANCEL
REPEAT
RANDOM
PROGRAM
REC PAUSE
TRACK MARKING
TITLE EDIT
DISPLAY CHARA
SCROLL
ENTER
SET
JVC
RM-SMD2EU
REMOTE CONTROL
MD

1 ⏻/I (STANDBY/ON) button
2 Numeric keys
3 **CANCEL** button
4 **PROGRAM** button
5 **RANDOM** button
6 MD control buttons
● REC PAUSE
II (Pause)
■ (Stop)
▶ (Play)
◀◀, ▶▶
◀◀, ▶▶
7 **SCROLL** button
8 **SET** button
9 **DISPLAY/CHARA** button
10 **TITLE/EDIT** button
11 **ENTER** button
12 **TRACK MARKING** button
13 **REPEAT** button
14 ▲ (Eject) button

Setting up the System

Supplied Accessories

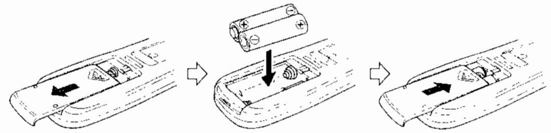
Before setting up your system make sure you received all of the following supplied accessories.

AC power cord (1)
Audio pin cord (2)
Compu Link cable (1)
Optical digital cable (1)
Batteries R6P (SUM-3)/AA (15F) (2)
Remote Control (1)

Remote control batteries

Match the polarity (+ and –) on the batteries with the + and – markings in the battery compartment.

R6P (SUM-3)/AA (15F)



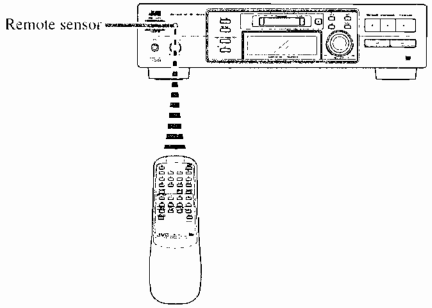
CAUTION: Handle batteries properly.

To avoid battery leakage or explosion:

- Remove batteries when the Remote Control will not be used for a long time.
- When you need to replace the batteries, replace both batteries at the same time with new ones.
- Do not use an old battery with a new one.
- Do not use different types of batteries together.

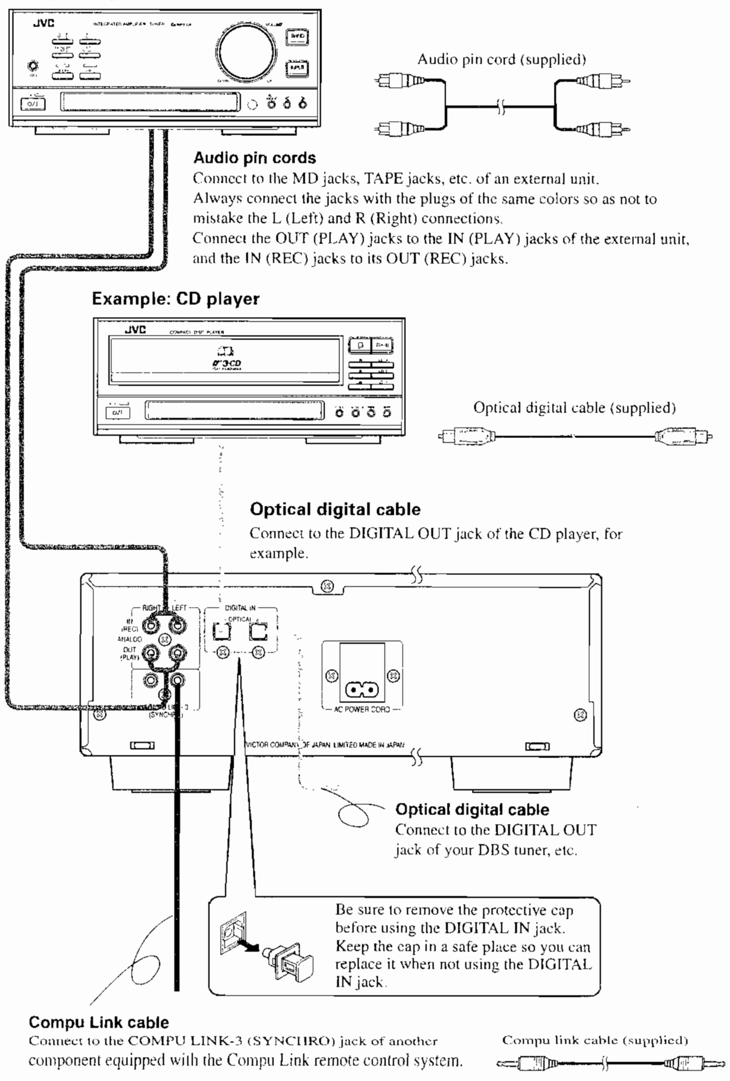
Operating the Remote Control

The remote control makes it easy to use many of the functions of the system from a distance of up to 7 m (23 feet) away.
You need to point the remote control unit at the remote sensor on the front panel.



Connection

Signal cable connections



Audio pin cord (supplied)

Audio pin cords

Connect to the MD jacks, TAPE jacks, etc. of an external unit.
Always connect the jacks with the plugs of the same colors so as not to mistake the L (Left) and R (Right) connections.
Connect the OUT (PLAY) jacks to the IN (PLAY) jacks of the external unit, and the IN (REC) jacks to its OUT (REC) jacks.

Optical digital cable (supplied)

Optical digital cable

Connect to the DIGITAL OUT jack of the CD player, for example.

Optical digital cable

Connect to the DIGITAL OUT jack of your DBS tuner, etc.

Be sure to remove the protective cap before using the DIGITAL IN jack.
Keep the cap in a safe place so you can replace it when not using the DIGITAL IN jack.

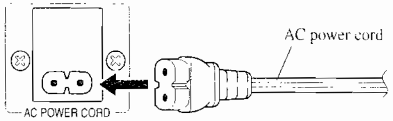
Compu Link cable

Connect to the COMPU LINK-3 (SYNCHRO) jack of another component equipped with the Compu Link remote control system.

Compu link cable (supplied)

AC power cord connection

First, firmly insert the supplied AC power cord into the AC inlet on the back of the unit.
Next, plug the AC power cord plug into the wall outlet.



Cautions

- **Use only the JVC AC power cord provided with this system to avoid malfunction or damage to the system.**
- **Be sure to unplug the power cord from the outlet when going out or when the system is not in use for an extended period of time.**

Turning the Power On and Off

Power On

STANDBY
⏻/I
STANDBY/ON

1 Press ⏻/I STANDBY/ON on the main unit or the remote control unit.
The STANDBY indicator goes out, the disc indicator lights in green, and the display comes on. The MD indicator lights up on the display.

When no MD is loaded:

"NO DISC" is shown on the display.

When an MD is already loaded:

The following messages are shown on the display in succession.

- "TOC Reading"
- The disc title, if the MD has.
- Number of tracks and the total playing time of the MD

You can play the MD by pressing ►/II on the main unit or ► on the remote control unit. For detailed description, see "Playback" on the next page.

Power Off

STANDBY
⏻/I
STANDBY/ON

1 Press ⏻/I STANDBY/ON again.
The STANDBY indicator lights up, the disc indicator goes out, and the display becomes blank.

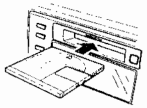
- Some power (7W) is always consumed even though power is turned off (called Standby mode).
- To switch off the system completely, unplug the AC power cord from the AC outlet.

English

Playback

Normal playback

The basic operation for playing an MD is described below. When no MD is loaded yet, "NO DISC" is shown on the display.



1 Load an MD.
Hold an MD with the side on which an arrow is marked facing up, and insert it into the slot in the direction of the arrow.
The MD will be pulled in automatically from the middle.

Loading
↓
TOC Reading
↓
6 32:00
Number of tracks Total playing time

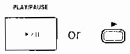
- If the MD has a disc title, the display shows the disc title then the number of tracks and total playing time of the MD.
- The tracks in the MD appears on the music calender.

Note: To allow easy insertion, insert the MD along the upper part of the MD insertion slot.

Caution

- **Do not mistake the MD insertion direction, otherwise malfunction will result.**

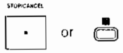
Shortcut:
You can insert an MD in Standby mode. Then, the power is turned on and the MD is pulled in automatically.



2 Press ►/II on the main unit or ► on the remote control unit.
Playback starts.
The ► indicator blinks for a while and then stays lit.
The playback level for the L and R channels are shown on the level indicators.

- If the track has a title, the track title will be displayed before playing the track.
- The track number that has been played disappears from the music calender.
- The MD automatically stops when the last track of the MD has finished playing.

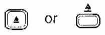
Shortcut:
When you press ►/II on the main unit or ► on the remote control unit in Standby mode, power is turned on and the MD is automatically played. However, if no MD is loaded, "NO DISC" is shown on the display.



To stop the MD:

Press ■ on the main unit or the remote control unit.

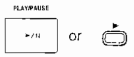
- If the MD has a disc title, the display shows the disc title then the number of tracks and total playing time of the MD.



To eject the MD:

Press ▲ on the main unit or the remote control unit.
The MD is ejected and the display changes as follows:

EJECT → NO DISC

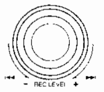


To pause the MD:

Press ►/II on the main unit or press II on the remote control unit.
The II indicator lights up.
To cancel pause, press ►/II on the main unit or press ► on the remote control unit. The MD starts from the position where it has paused.

To select a track

You can select a desired track during playback or in Stop mode. When you use the numeric keys on the remote control unit in Stop mode, the selected track automatically starts playing.



Main unit:

During playback, turn the jog dial to the right or left to select the track you want. Then, the selected track starts playing.

- Turn the jog dial to the right by one click to skip to the beginning of the next track.
- Turn the jog dial to the left by one click to skip to the beginning of the current track being played. While "--:--" is shown on the display, you can play the previous track by turning the jog dial to the left.

In Stop mode, you can select a track in the same way. To start playback, press ►/II.

Remote control unit:

Using I◄◄ or ►►I :

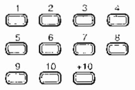
During playback, press I◄◄ or ►►I to select the track you want. Then, the selected track starts playing.

- Press ►►I once to skip to the beginning of the next track.
- Press I◄◄ once to skip to the beginning of the current track being played. While "--:--" is shown on the display, you can play the previous track by pressing I◄◄.

In Stop mode, you can select a track in the same way. To start playback, press ►.

Using the numeric keys:

During playback or in Stop mode, select a track with the numeric keys. Then, the selected track starts playing.

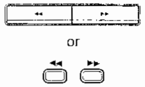


Selecting a track with the numeric keys:

To select track No. 5 : Press 5.
To select track No. 15: Press +10 then 5.
To select track No. 20: Press +10 then 10.
To select track No. 52: Press +10 five times then press 2.

- When you try to select a track number greater than the recorded tracks in the MD, the last track is automatically selected.

Search play



During playback, you can fast forward/backwards the MD to quickly find a particular passage in the track you are listening to.
To perform this, press and hold ◄◄ or ►► on the main unit or the remote control unit.

Using headphones

Connect a pair of headphones (not supplied) to the PHONES jack to listen to the playback sound of the MD or rec-monitor sound.

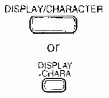
- The output from the unit is not cut off even if the headphones are used.

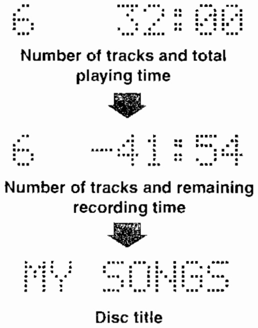
Caution

- **Be sure to turn down the PHONES LEVEL control before connecting or putting on headphones.**

Switching the displayed information

The display can show the disc title, track title and remaining time (recording time available when a recordable MD is loaded) information.




6 32:00
Number of tracks and total playing time
6 -41:54
Number of tracks and remaining recording time
MY SONGS
Disc title

When no track is selected (In Stop mode):

Press DISPLAY/CHARACTER on the main unit or the remote control unit.
Each press of the button switches the displayed information as follows.

→ Number of tracks and total playing time → Number of tracks and remaining recording time → Disc title →

- A disc title composed of more than 11 characters is scrolled, and the first 11 characters are displayed after scrolling.
- The display shows "NO TITLE" if the disc has no title assigned to it.

NO TITLE

When a track has already been selected (During playback or in Stop mode):

Press DISPLAY/CHARACTER on the main unit or the remote control unit.
Each press of the button switches the displayed information as follows.

→ Track No. and its playing time → Track title →

- A track title composed of more than 11 characters is scrolled, and the first 11 characters are displayed after scrolling.
- The display shows "NO TITLE" if the track has no title assigned to it.

Program playback

You can program up to 32 tracks in any desired order including the same tracks.

- You can only make a program in Stop mode.

1 **Load an MD.**
See "Normal playback " on page 8.

2 **Select Program mode.**

Main unit:
Press PLAY MODE until "PROGRAM" is shown. Then, the PROGRAM indicator lights up.
Each time PLAY MODE is pressed, the play mode indicators switches as follows:

PROGRAM

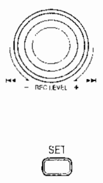
→ PROGRAM → RANDOM → Off (Continuous play) →

Remote control unit:
Press PROGRAM. The "PROGRAM" is shown and the PROGRAM indicator lights up.
To exit Program mode, press PROGRAM once again. Then, the PROGRAM indicator goes out.

The display shows the following for programming.

1 P 0

The first track



3 Select desired track numbers to be programmed.

Main unit:

1 Turn the jog dial to the right or left to select the desired track number to be programmed. (Turning it to the right increases the track number and vice versa.)
  The selected track number will blink.

2 Press SET.
  The track number stays lit and the program number increases by 1. Also, the programmed track is indicated on the music calender.
  Then, the total playing time is displayed instead of the program number.

Example)

Number of programmed tracks — Total playing time

14 P 12 ➡ 14 42:12

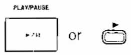
The last programmed track — The last programmed track

3 Repeat steps 1 and 2 to select the other tracks for the program.

Remote control unit:

1 Select the desired track number with the numeric keys.
  The selected track number is programmed and the program number is displayed.
  Then, the total playing time is displayed instead of the program number.
  To select a track, see "Selecting a track with the numeric keys" on page 9.

2 Repeat step 1 to select the other tracks for the program.



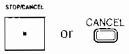
4 Press ►/II on the main unit or ► on the remote control unit.

Program playback starts in the programmed order.

- Program playback stops after having played all programmed tracks.
- To stop playing, press ■ on the main unit or the remote control unit.
- To skip the programmed track, turn the jog dial on the main unit to the right or left or press |◄◄ or ►►| on the remote control unit.

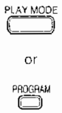
To check the programmed tracks and their order (In Stop mode):

Press |◄◄ or ►►| on the remote control unit in Stop mode. The programmed tracks will be successively displayed in the programmed order. (The track title will be displayed before the track number, if it is written.)



If you make a mistake in programming (In Stop mode):

Press ■ STOP/CANCEL on the main unit or CANCEL on the remote control unit in Stop mode to clear the last track. Each press of the button clears the last track in the program. Press the button repeatedly until the track you programmed by mistake is cleared and then re-program tracks from that point.



To exit Program Play mode (In Stop mode):

Main unit:

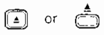
Press PLAY MODE in Stop mode to select any mode other than Program Play mode.

Remote control unit:

Press PROGRAM in Stop mode to light off the PROGRAM indicator.

The program contents remain in memory even after the unit has exited Program Play mode.

Note: The program contents are cleared from memory when the power cord is unplugged or in case of power failure.



To clear the program:

Press ▲ on the main unit or the remote control unit.
The programmed tracks are cleared then the MD is ejected.

To play programmed tracks repeatedly:

Combine the program playback and repeat playback to play the programmed tracks repeatedly.
For the repeat playback, see page 13.

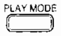
Random playback

Tracks in the MD can be played in a randomly selected order. The random playback may bring you a surprising effect by playing tracks in a different order every time.

- You can only select the random play in Stop mode.

1 Load an MD.

See "Normal playback" on page 8.



2 Press PLAY MODE to select RANDOM.

Main unit:

Press PLAY MODE until "RANDOM" is shown. Then, the RANDOM indicator lights up.

14 RANDOM

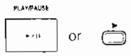
Number of tracks

Each time PLAY MODE is pressed, the play mode indicators switches as follows:

→ PROGRAM → RANDOM → Off (Continuous play) ←

Remote control unit:

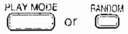
Press RANDOM. The "RANDOM" is shown and the RANDOM indicator lights up.
To exit Random mode, press RANDOM once again. Then, the RANDOM indicator goes out.



3 Press ►/II on the main unit or ► on the remote control unit.

Random playback starts.

- Random playback stops after having played every track once.
- To stop playing, press ■ on the main unit or the remote control unit.



To exit Random Play mode (In Stop mode):

Main unit:

Press PLAY MODE in Stop mode to select any mode other than Random Play mode.

Remote control unit:

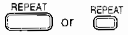
Press RANDOM in Stop mode to light off the RANDOM indicator.

To repeat random playback:

Combine the random playback and repeat playback to play tracks repeatedly in random orders. The order tracks are played differs every time random playback is repeated.
For the repeat playback, see page 13.

Repeat playback

You can repeat all the tracks or single track in each playback mode.



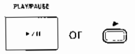
1 Press REPEAT on the main unit or the remote control unit to select Repeat Play mode.

Each time REPEAT is pressed, the repeat mode indicators switches as follows.

→ REPEAT ALL → REPEAT 1 → Off (Repeat playback canceled) →

REPEAT ALL : In Normal Play mode, repeats all the tracks.
In Program Play mode, repeats all the tracks in the program.
In Random Play mode, repeats all the tracks in random order.

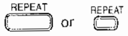
REPEAT 1 : Repeats one track.



2 Press ►/II on the main unit or ► on the remote control unit.

Repeat playback starts.

- To stop playing, press ■ on the main unit or the remote control unit.



To cancel repeat playback:

Press REPEAT on the main unit or the remote control unit until the repeat mode indicator goes out.

English

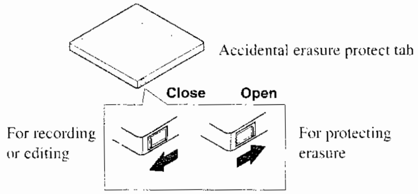
English

Recording

An audio signal from a variety of sources can be recorded by using either digital or analog input as required.

Things to know before recording

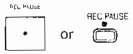
- It may be unlawful to record or play back copyrighted material without the consent of the copyright owner.
- Carefully read the "Rule on Digital Copying" on page 31.
- The MD recorder supports the following sampling frequencies for digital sources DIGITAL 1 and DIGITAL 2 and lights the sampling frequency being received on the display.
  32 kHz, 44.1 kHz and 48 kHz
- Recording level adjustment:
  When recording a digital input, the recording level is automatically set correctly.
  When recording an analog input, it is necessary to adjust the recording level properly.
- The accidental erasure protect tab is provided on the back of an MD cartridge to prevent accidental erasure or recording. It must be set to the close position before recording. Otherwise, "DISC PROTECTED" will appear when you try to record a signal to the MD.



- When you stick an adhesive label onto the MD cartridge, adhere it securely. If it peels off, ejection trouble, etc. will occur.
- Be sure that the MD is not the Playback-only type one. (See "Two disc types" on page 32.)
- Be sure that the MD has enough space for recording. If not, carry out ERASE ALL or ERASE function to erase all the tracks or desired tracks in the MD. You can check the recordable remaining time of the MD. (See "To display the remaining recording time" on page 16.)

Recording operation

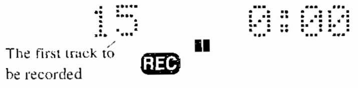
1 Load a recordable MD.

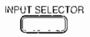


2 Press ● REC PAUSE on the main unit or the remote control unit.

The MD recorder enters Rec/Pause mode. The REC and II (Pause) indicators light up and the first track to be recorded is displayed. Also, the disc indicator lights in red.

Example) When 14 tracks are already recorded





3 Select the input by pressing INPUT SELECTOR on the main unit.

Each press of INPUT SELECTOR switches the inputs as follows.

→ DIGITAL 1 IN → DIGITAL 2 IN → ANALOG IN ⏎

DIGITAL 1 IN: Select this to record the digital input from the digital source component connected to the DIGITAL IN 1 optical jack.
The DIGITAL 1 indicator lights up.

DIGITAL 2 IN: Select this to record the digital input from the digital source component connected to the DIGITAL IN 2 optical jack.
The DIGITAL 2 indicator lights up.

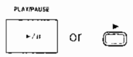
ANALOG IN : Select this to record the analog input from the analog source component (cassette deck, tuner, etc.) connected to the ANALOG IN (REC jacks).

4 Play the source to be recorded.

The level indicators show the input levels.

- The input level should be adjusted when the analog input is recorded (see "To adjust the analog input level" below).
- The input level for the digital inputs does not need adjustment.
- When DIGITAL 1 or DIGITAL 2 is selected, one of the sampling frequency indicators lights up. For example, 44.1kHz indicator is displayed for a CD player input.
  However, if no source component is connected to the digital input or the sampling frequency input is other than 32 kHz, 44.1 kHz, or 48 kHz, "DIGITAL IN UNLOCK" scrolls on the display showing that the recording is impossible.

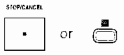
DIGITAL 1
44.1kHz



5 Press ▶/II on the main unit or ▶ on the remote control unit.

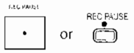
Recording starts.
The ▶ indicator lights up.

- When the MD becomes full, "UTOCwriting" is displayed indicating that the recording is successfully completed. Then, the MD stops. The disc indicator lights in green.



To stop recording:

Press ■ on the main unit or the remote control unit.
"UTOCwriting" is displayed and the MD stops. The disc indicator lights in green.

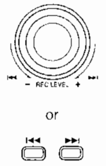


To pause the MD:

Press ● REC PAUSE on the main unit or the remote control unit.
To resume recording, press ▶/II on the main unit or ▶ on the remote control unit.

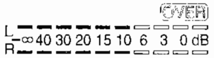
To adjust the analog input level

The input level should be adjusted before recording the analog input.



1 In Rec/Pause mode, start playing the source for level adjustment.
The level indicators show the input levels.

2 Turn the jog dial on the main unit to the right or left or press |◀◀ or ▶▶| on the remote control unit to increase or decrease the recording level.
As you adjust the recording level, "VOL. –10" will appear, for example. You can adjust the recording level between VOL.–50 and VOL.0 (–50 dB and 0 dB), or to VOL. – – – (below –50 dB).



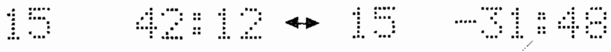
English

- Normally the input level should be adjusted so that the segments for 0 dB blink at the peak level.
- When the input level is too high, the OVER indicator will light up, resulting in distorted recording.

To display the remaining recording time

DISPLAY/CHARACTER
or
DISPLAY CHARA

In Rec/Pause or during recording, press DISPLAY/CHARACTER on the main unit or the remote control unit.
Each press of the button switches the elapsed recording time display and remaining recording time display alternately.



remaining recording time

Track marking

The track numbers on the MD are marked at the beginning of each track. The track numbers are identified by these "track markings" and each section between two track markings are considered as a track.

For analog input:

You can create the track marking automatically or manually.

Automatic track marking:

TRACK MARKING

Press TRACK MARKING on the remote control unit to select "AUTO".

- A track marking is automatically recorded every time a blank of more than 3 seconds is detected.

Manual track marking:

TRACK MARKING

1 Press TRACK MARKING on the remote control unit to select "MANUAL".

2 When the point you want to record a track marking comes during recording, press SET on the remote control unit.
This operation records a track marking at the point where the button is pressed.

For digital input:

When tracks are recorded from a CD player by digital input, track markings are recorded automatically at the points where the CD tracks change.

0898TTMCRESAN

JVC

VICTOR COMPANY OF JAPAN, LIMITED

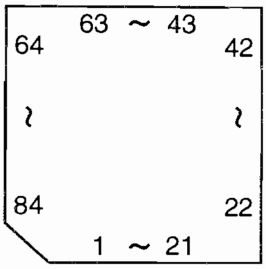
EN,GE,FR,NL,SP,IT

<<MEMO>>

Description of Major ICs

■MN173222AS(IC250):Display&System control

1.Terminal Layout



2.Key matrix

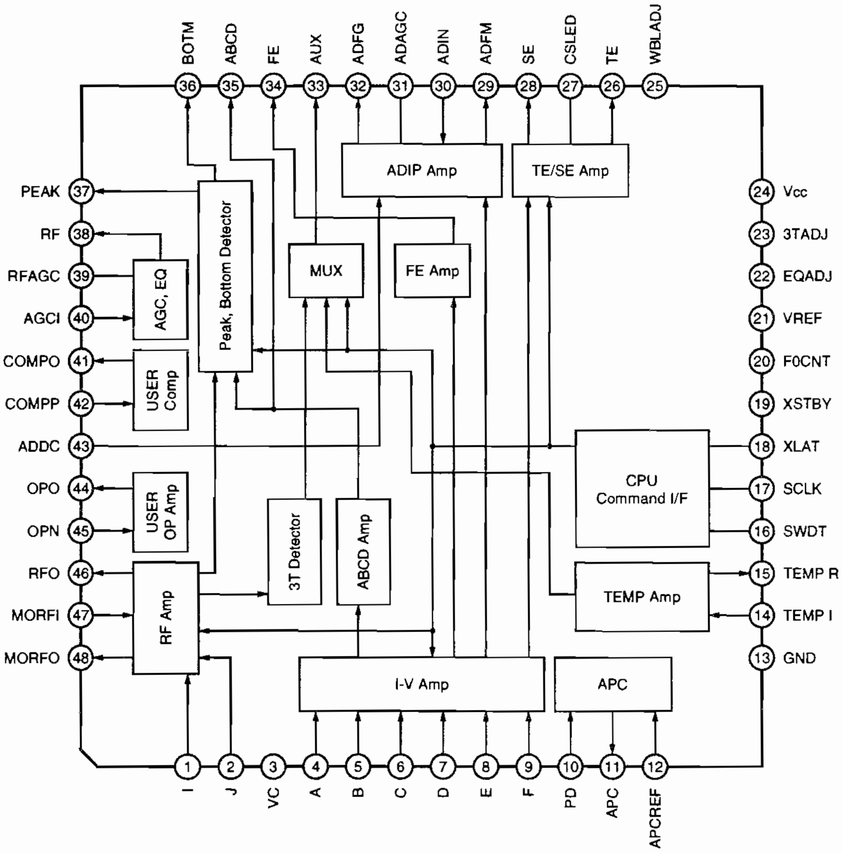
	KI0	KI1	KI2	KI3
KO0	INPUT	DISPLAY	REPEAT	PLAY MODE
KO1	Power on /off	REC PAUSE	—	⏏
KO2	TITLE	SET	▷/II	□
KO3	◁◁	▷▷	ENTER	EDIT

3.Pin Function

PIN NO.	Symbol	I/O	Function	PIN NO.	Symbol	I/O	Function
1~3	G11~S13	O	FL grid control output	56	$\overline{\text{LEDGREEN}}$	O	Green LED control output
4~22	S1~S19	O	FL segment control output	57	$\overline{\text{LEDRED}}$	O	Red LED control output
23	-VPP	-	Power supply for FL	58	DCSO	O	DCS signal output
24~39	S20~S35	O	FL segment control output	59	DCSI	I	DCS signal input
40	NC	-	Non connect	60~63	KI0~KI3	I	Key matrix signal input
41	MDCLK	O	MD clock signal output	64	$\overline{\text{LEDPOW}}$	O	Standby LED control output
42	MDSTAT	I	MD statuas signal output	65	JOG1	I	Jog pulse input
43	MDCOM	O	MD command signal output	66	JOG2	I	Jog pulse input
44	NC	-	Non connect	67	NC	-	Non connect
45	DVCLK	O	Clock signal output for IC800	68	$\overline{\text{RST}}$	I	Reset signal input
46	DVSTB	O	Strove signal output for IC800	69	D.GND	I	Digital ground
47	DVDATA	O	Data signal output	70	NC	-	Non connect
48	MDREADY	I	MD ready signal input	71	D.GND	I	Digital ground
49	$\overline{\text{REM}}$	I	Remocon signal input	72	OSC2	O	Oscillation terminal
50	$\overline{\text{TESTMODE}}$	I	Terminal for MP	73	OSC1	I	Oscillation terminal
51	$\overline{\text{DO}}$/EXP	I	For version change	74	D+5V	I	Power supply
52	POWON	O	±10V control output	75	G1/KO0	O	FL grid control output/Key matrix output
53	DINSW	O	Digital input control output	76	G2/KO1	O	FL grid control output/Key matrix output
54	SMUTE1	O	System mute 1	77	G3/KO2	O	FL grid control output/Key matrix output
55	SMUTE2	O	System mute 2	78	G4/KO3	O	FL grid control output/Key matrix output
				79~84	G5~G10	O	FL grid control output

■ CXA2523AR(IC310):MD Servo

1.Block Diagram


BOTM
ABCD
FE
AUX
ADFG
ADAGC
ADIN
ADFM
SE
CSLED
TE
WBLADJ
36
35
34
33
32
31
30
29
28
27
26
25
ADIP Amp
TE/SE Amp
PEAK 37
RF 38
RFAGC 39
AGCI 40
COMPO 41
COMPP 42
ADDC 43
OPO 44
OPN 45
RFO 46
MORFI 47
MORFO 48
AGC, EQ
Peak, Bottom Detector
MUX
FE Amp
USER Comp
USER OP Amp
3T Detector
ABCD Amp
RF Amp
CPU Command I/F
TEMP Amp
I-V Amp
APC
24 Vcc
23 3TADJ
22 EQADJ
21 VREF
20 FOCNT
19 XSTBY
18 XLAT
17 SCLK
16 SWDT
15 TEMP R
14 TEMP I
13 GND
1 I
2 J
3 VC
4 A
5 B
6 C
7 D
8 E
9 F
10 PD
11 APC
12 APCREF

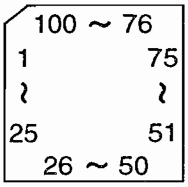
2.Pin Function

Pin No.	Symbol	I/O	Function
1	I	I	I-V converted RF signal I input.
2	J	I	I-V converted RF signal J input.
3	VC	O	Vcc/2 voltage output.
4	A	I	A current input for main beam servo signal.
5	B	I	B current input for main beam servo signal.
6	C	I	C current input for main beam servo signal.
7	D	I	D current input for main beam servo signal.
8	E	I	E current input for side beam servo signal.
9	F	I	F current input for side beam servo signal.
10	PD	I	Reflection light quantity monitor signal input.
11	APC	O	Laser APC output.
12	APCREF	I	Reference voltage input for the laser power intensity setting.
13	GND	-	Connect to GND.
14	TEMPI	I	Connects the temperature sensor.
15	TEMP R	I	Connects the temperature sensor. outputs the reference voltage.
16	SWDT	I	Data input for microcomputer serial interface.
17	SCLK	I	Shift clock input for microcomputer serial interface.
18	XLAT	I	Latch signal input for microcomputer serial interface.Latched when low.
19	XSTBY	I	Standby setting pin. Normal operation when high Standby when low.
20	F0CNT	I	Internal current source setting pin.

Pin No.	Symbol	I/O	Function
21	VREF	O	Reference voltage output.
22	EQADJ	I/O	Equalizer center frequency setting pin.
23	3TADJ	I/O	BPF3T center frequency setting pin.
24	Vcc	-	Power supply.
25	WBLADJ	I/O	BPF22 center frequency setting pin.
26	TE	O	Tracking error signal output.
27	CSLED	-	Connects the sled error signal LPF capacitor.
28	SE	O	Sled error signal output.
29	ADFM	O	ADIP FM signal output.
30	ADIN	I	ADIP signal comparator input.
31	ADAGC	-	Connects the ADIPAGC capacitor.
32	ADFG	O	ADIP2 binary value signal output.
33	AUX	O	13 output / temperature signal output. Switched with serial commands.
34	FE	O	Focus error signal output.
35	ABCD	O	Reflection light quantity signal output for the main beam servo detector.
36	BOTM	O	RF/ABCD bottom hold signal output.
37	PEAK	O	Peak hold signal output for the RF/ABCD signals.
38	RF	O	RF equalizer output.
39	RFAGC	-	Connects the RFAGC capacitor.
40	AGCI	I	RFAGC input.
41	COMPO	O	User comparator output.
42	COMPP	I	User comparator non-inverted input.
43	ADDC	I/O	Connects the capacitor for ADIP amplifier feedback circuit.
44	OPO	O	User operational amplifier output.
45	OPN	I	User operational amplifier inverted input.
46	RFO	O	RF amplifier output. Eye pattern checkpoint.
47	MORFI	I	Input of the groove RF signal with AC coupling.
48	MORFO	O	Groove RF signal output.

■ HD6433045SV09F(IC500) : MD Control Micon

1.Terminal Layout



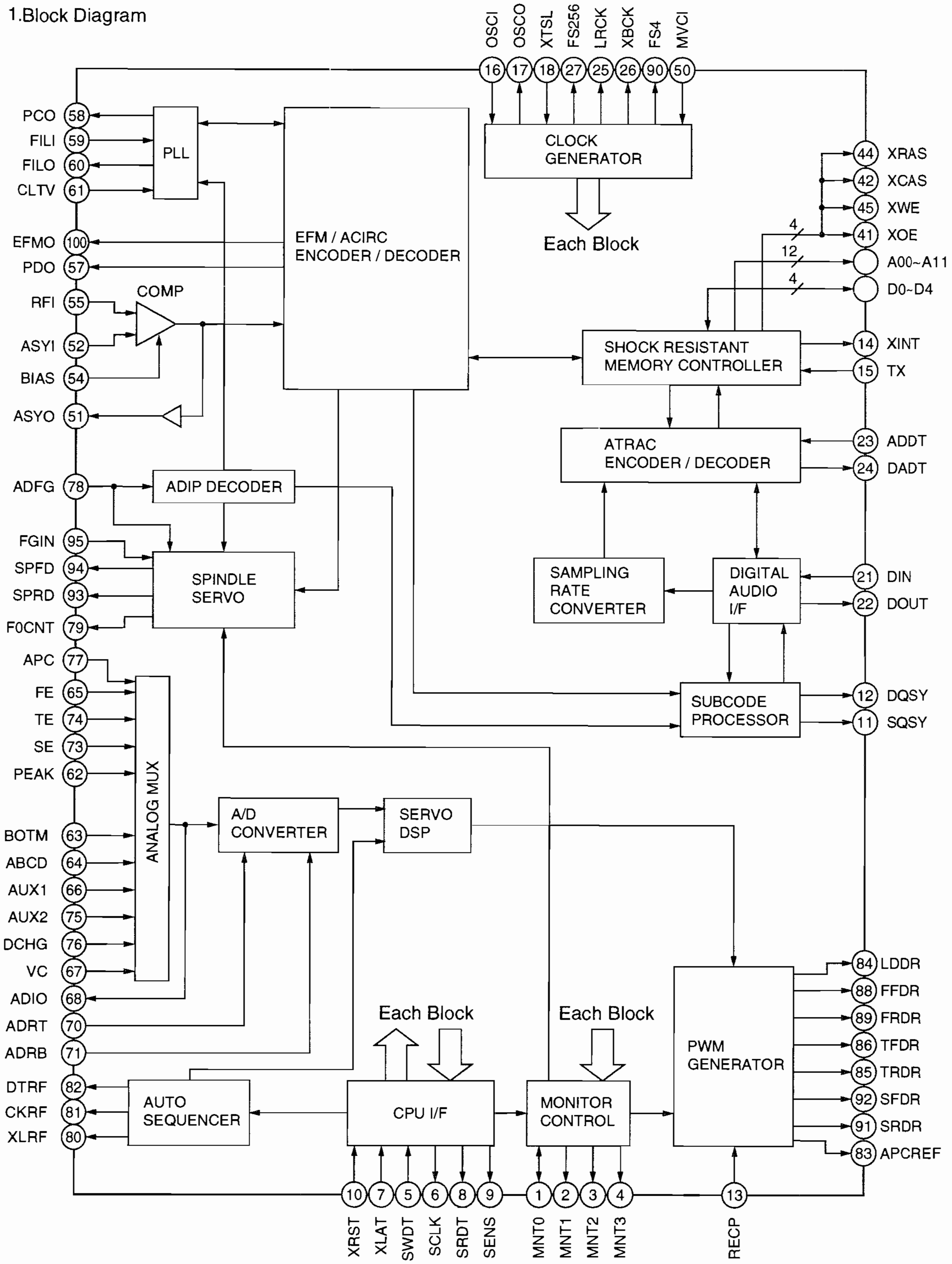
2.Pin Function

PIN No.	Symbol	I/O	Function
1	VCC	-	Power supply.
2	DIUNL	-	"H" is output at "Digital IN unlock".
3	$\overline{\text{MODON}}$	O	L:Harmonic weight ON, at playback.
4	MODCHG	O	L:PLAY H:REC (Harmonic weight power).
5	TX	O	Data output enable signal when recording.
6	RECP	O	Connect to RECP terminal for IC350.
7	XTSL	O	Connect to XTSL terminal for IC350.
8	XRST	O	Connect to XRDT terminal for IC350.
9	XLAT	O	Connect to XLAT terminal for IC350.
10	RESO	-	When the flash memory is written it is the voltage supply of +12V terminal.
11	GND	-	Connect to GND.
12	STATUS	O	Status signal output to IC901.
13	SWDT	O	Serial bus light output terminal to IC350.
14	COMMAND	I	command data input from IC901.
15	SRDT	I	Serial bus lead input terminal to IC350.
16	COMCLK	O	Clock signal to IC901.
17	SCLK	I	Serial bus clock output terminal to IC350.
18	STSRDY	O	Ready signal from IC901.
19	MEMUTE	O	Pick up drive mute terminal.
20	MHON	O	Magnetic head drive control terminal L:At recording.
21	P.ON	O	Power ON/OFF control terminal H:Power ON.
22	GND	-	Connect to GND.
23	PWAD	O	A/D converter ON/OFF control terminal for audio, L:Power down.
24	PWDA	O	D/A converter ON/OFF control terminal for audio, L:Power down.
25	EMPHE	O	Playback signal emphasis ON/OFF signal L:ON.
26	NC	-	Non connect.
27	EJECT	O	Motor driver control signal output. H:EJECT L:LOAD
28	LOAD	O	Motor driver control signal output. H:LOAD L:EJECT
29~34		-	Non connect.
35	VCC	-	Power supply.
36	SSTOP	I	Limit switch ON/OFF detect signal terminal for surroundings detection the in disc.
37	MREF	I	Disc hole detect switch (Reflectivity detection input).
38	MPROT	I	Disc hole detect switch (Recording protection detection input).
39~43		-	Non connect.

PIN No.	Symbol	I/O	Function
44	GND	-	Connect to GND.
45	PLAY SW	I	Play switch detection.
46	LOAD SW	I	Load switch detection.
47~52		-	Non connect.
53	SEL0	I	ID when controlling simultaneously (pull up MOS) At normal use:H.
54	SEL1	I	ID when controlling simultaneously (pull up MOS) At normal use:H.
55	SEL2	I	ID when controlling simultaneously (pull up MOS) At normal use:H.
56	SEL3	I	ID when controlling simultaneously (pull up MOS) At normal use:H.
57	GND	-	Connect to GND.
58	MMONI0	O	Parallel operation monitor terminal.
59	MMONI1	O	Parallel operation monitor terminal.
60	MMONI2	O	Parallel operation monitor terminal.
61	0	O	Parallel operation monitor terminal.
62	STBY	-	Connect to VCC.
63	RESET	I	Reset signal input terminal.
64	NMI	I	Connect to VCC.
65	GND	-	Connect to GND.
66	EXTAL	-	Oscillation terminal (8MHz).
67	XTAL	-	Oscillation terminal (8MHz).
68	VCC	-	Power supply.
69	MMONI3	O	Parallel operation monitor terminal.
70	SCL	O	EEPROM Serial clock output to IC590,IC591.
71	DI	O	EEPROM Data output to IC590,IC591.
72	CS	O	EEPROM Chip select terminal output to IC590,IC591.
73	MD0	-	Connect to VCC.
74	MD1	-	Connect to VCC.
75	MD2	-	Connect to VCC.
76	AVCC	-	Connect to VCC.
77	Vref	-	Connect to VCC.
78	MODESE	I	Operation mode select terminal for Micon H:Time usually.
79	SET1	I	External communication method selection terminal, H:UART L:four line type.
80	SET2	I	DOUT selection terminal, H:DIN output L:FS convert output.
81	SET3	I	Digital output selection terminal H:OFF L:ON.
82	MT0	I	Monitor output selection terminal of IC350.
83	MT1	I	Monitor output selection terminal of IC350.
84	MT2	I	Monitor output selection terminal of IC350.
85	MT3	I	Monitor output selection terminal of IC350.
86	GND	-	Connect to GND.
87	XINT	I	Interruption status input terminal of IC350.
88	DQSY	I	Digital in of U-bit, Sub code Q sink input terminal.
89	SQSY	I	Sub code Qsink input terminal.
90	NC	-	Non connect.
91	NC	-	Non connect.
92	GND	-	Connect to GND.
93	MNT0	I	Connect to MNT0 terminal of IC350.
94	MNT1	I	Connect to MNT1 terminal of IC350.
95	MNT2	I	Connect to MNT2 terminal of IC350.
96	MNT3	I	Connect to MNT3 terminal of IC350.
97	SENS	I	Status signal input terminal from IC350.
98	DO	I	EEPROM Serial data input terminal from IC590,IC591.
99	X.SEL	I	Crystal oscillation frequency selection terminal, L:22.5792MHz H:45.1584MHz.
100	VCC	-	Power supply.

■ CXD2652AR(IC350)

1.Block Diagram


OSCI
OSCO
XTSL
FS256
LRCK
XBCK
FS4
MVCI
16
17
18
27
25
26
90
50
CLOCK GENERATOR
Each Block
PCO
58
FILI
59
FILO
60
CLTV
61
PLL
EFMO
100
PDO
57
RFI
55
COMP
ASYI
52
BIAS
54
ASYO
51
EFM / ACIRC ENCODER / DECODER
44
XRAS
42
XCAS
45
XWE
4
41
XOE
12
A00~A11
4
D0~D4
SHOCK RESISTANT MEMORY CONTROLLER
14
XINT
15
TX
ATRAC ENCODER / DECODER
23
ADDT
24
DADT
ADFG
78
ADIP DECODER
FGIN
95
SPFD
94
SPRD
93
F0CNT
79
SPINDLE SERVO
SAMPLING RATE CONVERTER
DIGITAL AUDIO I/F
21
DIN
22
DOUT
APC
77
FE
65
TE
74
SE
73
PEAK
62
SUBCODE PROCESSOR
12
DQSY
11
SQSY
ANALOG MUX
BOTM
63
ABCD
64
AUX1
66
AUX2
75
DCHG
76
VC
67
ADIO
68
ADRT
70
ADRB
71
A/D CONVERTER
SERVO DSP
Each Block
Each Block
PWM GENERATOR
84
LDDR
88
FFDR
89
FRDR
86
TFDR
85
TRDR
92
SFDR
91
SRDR
83
APCREF
DTRF
82
CKRF
81
XLRF
80
AUTO SEQUENCER
CPU I/F
MONITOR CONTROL
10
7
5
6
8
9
1
2
3
4
13
XRST
XLAT
SWDT
SCLK
SRDT
SENS
MNT0
MNT1
MNT2
MNT3
RECP

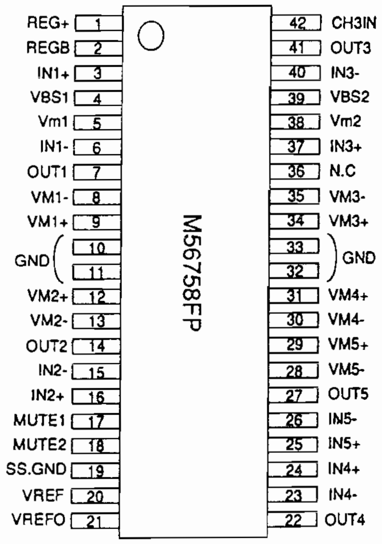
2.Pin Function

Pin No.	Symbol	I/O	Function
1	MNT0	I/O	Monitor output.
2	MNT1	O	Monitor output.
3	MNT2	O	Monitor output.
4	MNT3	O	Monitor output.
5	SWDT	I	Data input for microcomputer serial interface.
6	SCLK	I	Shift clock input for microcomputer serial interface
7	XLAT	I	Latch input for microcomputer serial interface.Latched at the falling edge.
8	SRDT	O	Data output for microcomputer serial interface.
9	SENS	O	Output the internal status corresponding to the microcomputer serial interface address.
10	XRST	I	Reset input. Low:reset
11	SQSY	O	Disc sub code Q sync/ADIP sync output.
12	DQSY	O	Sub code Q sync output in U-bit CD or MD format when the Digital in source is CD or MD
13	RECP	I	Laser power switching input. High:recording power Low:playback power.
14	XINT	O	Interruption request output. Low:when the interruption status occurs.
15	TX	I	Enable signal input for recording data output. High:enabled.
16	OSCI	I	Crystal oscillation circuit input.
17	OSCO	O	Crystal oscillation circuit output. (inverted output of the OSCI pin)
18	XTSL	I	OSCI input frequency switching. High:512Fs(22.5792MHz) Low:1024Fs(45.1584MHz)
19	DVDD	-	Digital power supply.
20	DVss	-	Digital ground.
21	DIN	I	Digital audio interface signal input.
22	DOUT	O	Digital audio interface signal output.
23	ADDT	I	Analog recording input (Connect to the external A/D converter output).
24	DADT	O	REC monitor output/decoded audio data output.
25	LRCK	O	LRCK(44.1kHz) output to the external audio block.
26	XBCK	O	Bit clock(2.8224MHz) output to the external audio block.
27	FS256	O	256Fs output.(11.2896MHz)
28	DVdd	-	Digital power supply.
29	A03	O	External DRAM address output.
30	A02	O	External DRAM address output.
31	A01	O	External DRAM address output.
32	A00	O	External DRAM address output.
33	NC	-	Non connect.
34	A04	O	External DRAM address output.
35	A05	O	External DRAM address output.
36	A06	O	External DRAM address output.
37	A07	O	External DRAM address output.
38	A08	O	External DRAM address output.
39		-	Non connect.
40	DVss	-	Digital ground.
41	XOE	O	External DRAM output enable.
42	XCAS	O	External DRAM $\overline{\text{CAS}}$ output.
43	A09	O	External DRAM address output.
44	XRAS	O	External DRAM $\overline{\text{RAS}}$ output.
45	XWE	O	External DRAM write enable.
46	D1	I/O	External DRAM data bus.
47	D0	I/O	External DRAM data bus.
48	D2	I/O	External DRAM data bus.
49	D3	I/O	External DRAM data bus.
50	MVCI	I	External VCO (784Fs) clock input.

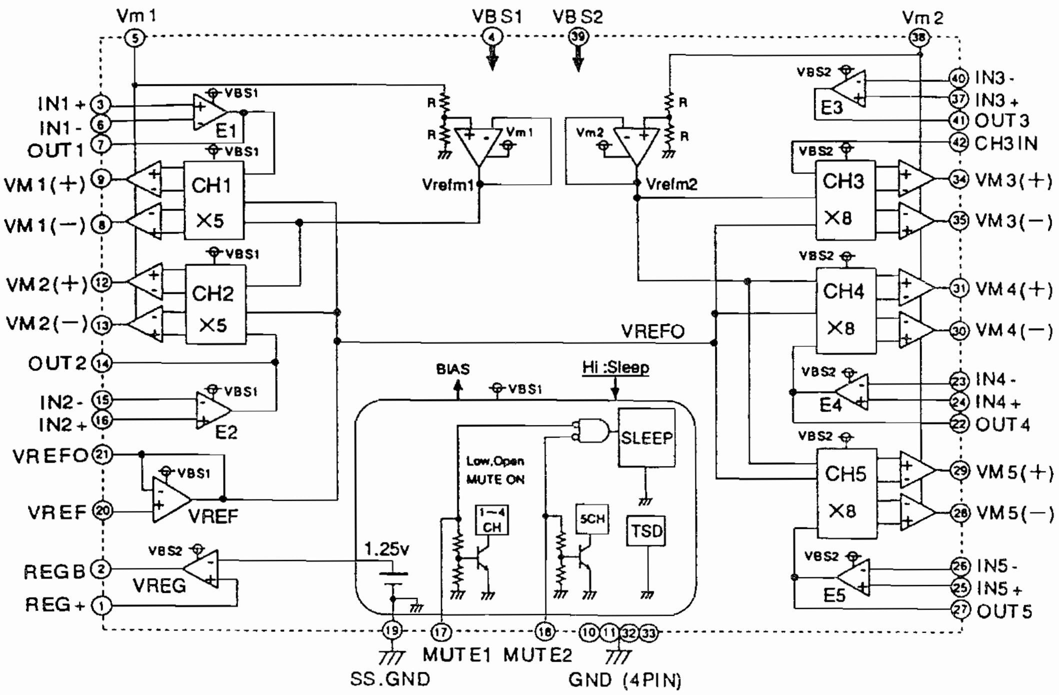
Pin No.	Symbol	I/O	Function
51	ASYO	O	Playback EFM full-swing output. (Low:Vss High:Vdd)
52	ASYI	I	Playback EFM comparator slice voltage input.
53	AVdd	-	Analog power supply.
54	BIAS	I	Playback EFM comparator bias current input.
55	RFI	I	Playback EFM RF signal input.
56	AVss	-	Analog ground.
57	PDO	O	Phase comparison output for analog PLL of EFM decoder.
58	PCO	O	Phase comparison output for master PLL of playback digital PLL and recoding EFM PLL.
59	FILI	I	Filter input for master PLL of playback digital PLL and recording EFM PLL.
60	FILO	O	Filter output for master PLL of playback digital PLL and recording EFM PLL.
61	CLTV	I	Internal VCO control voltage input for master PLL of playback digital PLL and recording EFM PLL.
62	PEAK	I	Peak hold signal input for quantity of light.
63	BOTM	I	Bottom hold signal input for quantity of light.
64	ABCD	I	Signal input for quantity of light.
65	FE	I	Focus error signal input.
66	AUX1	I	Auxiliary input1.
67	VC	I	Center voltage input.
68	ADIO	O	Monitor output for A/D converter input signal.
69	AVdd	-	Analog power supply.
70	ADRT	I	Voltage input for the upper limit of the A/D converter operating range.
71	ADRB	I	Voltage input for the lower limit of the A/D converter operating range.
72	AVss	-	Analog ground.
73	SE	I	Sled error signal input.
74	TE	I	Tracking error signal input.
75	AUX2	I	Auxiliary input 2.
76	DCHG	I	Connect to the low-impedance power supply.
77	TEST4	I	Error signal input for laser digital APC.
78	ADFG	I	ADIP binary FM signal (22.05±1kHz) input.
79	F0CNT	O	CXA2523 current source setting output.
80	XLRF	O	CXA2523 control latch output. Latched at the falling edge.
81	CKRF	O	CXA2523 control shift clock output.
82	DTRF	O	CXA2523 control data output.
83	APCREF	O	Reference PWM output for laser APC.
84	TEST0	-	Non connect
85	TRDR	O	Tracking servo drive PWM output.(-)
86	TFDR	O	Tracking servo drive PWM output.(+)
87	DVdd	-	Digital power supply.
88	FFDR	O	Focus servo drive PWM output.(+)
89	FRDR	O	Focus servo drive PWM output.(-)
90	FS4	-	Non connect.
91	SRDR	O	Sled servo drive PWM output.(-)
92	SFDR	O	Sled servo drive PWM output.(+)
93	SPRD	O	Spindle servo drive output.(PWM(-) or polarity)
94	SPFD	O	Spindle servo drive output.(PWM(+) or PWM absolute value)
95	FGIN	I	Spindle CAV servo FG input.
96	TEST1	I	Test pin.Connect to GND.
97	TEST2	I	Test pin.Connect to GND.
98	TEST3	I	Test pin.Connect to GND.
99	DVss	-	Digital ground.
100	EFMO	O	Low when playback:EFM (encoded data) output when recording.

■ M56758FP-X(IC410):5Channel actuater driver

1.Terminal Layout

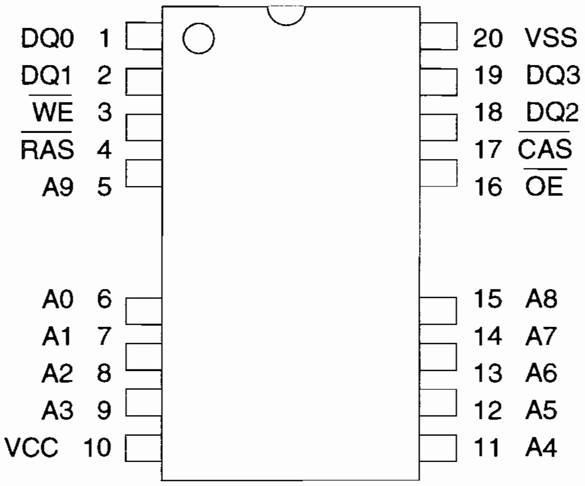

REG+ 1
REGB 2
IN1+ 3
VBS1 4
Vm1 5
IN1- 6
OUT1 7
VM1- 8
VM1+ 9
GND 10
11
VM2+ 12
VM2- 13
OUT2 14
IN2- 15
IN2+ 16
MUTE1 17
MUTE2 18
SS.GND 19
VREF 20
VREFO 21
42 CH3IN
41 OUT3
40 IN3-
39 VBS2
38 Vm2
37 IN3+
36 N.C
35 VM3-
34 VM3+
33 GND
32
31 VM4+
30 VM4-
29 VM5+
28 VM5-
27 OUT5
26 IN5-
25 IN5+
24 IN4+
23 IN4-
22 OUT4
M56758FP

2.Block Diagram


Vm 1
VBS1
VBS2
Vm 2
IN1 +
IN1 -
OUT 1
VM 1(+)
VM 1(−)
VM 2(+)
VM 2(−)
OUT 2
IN2 -
IN2 +
VREFO
VREF
REGB
REG +
E1
CH1
×5
CH2
×5
E2
VREF
VREG
VBS1
VBS2
R
Vm1
Vm2
Vrefm1
Vrefm2
VREFO
BIAS
Hi :Sleep
Low,Open
MUTE ON
1~4 CH
5CH
SLEEP
TSD
1.25v
IN3 -
IN3 +
OUT 3
CH3 IN
E3
CH3
×8
VM 3(+)
VM 3(−)
CH4
×8
VM 4(+)
VM 4(−)
IN4 -
IN4 +
OUT 4
E4
CH5
×8
VM 5(+)
VM 5(−)
IN5 -
IN5 +
OUT 5
E5
SS.GND
MUTE1
MUTE2
GND (4PIN)

■MN41V4400TT-08 (IC390) : D RAM

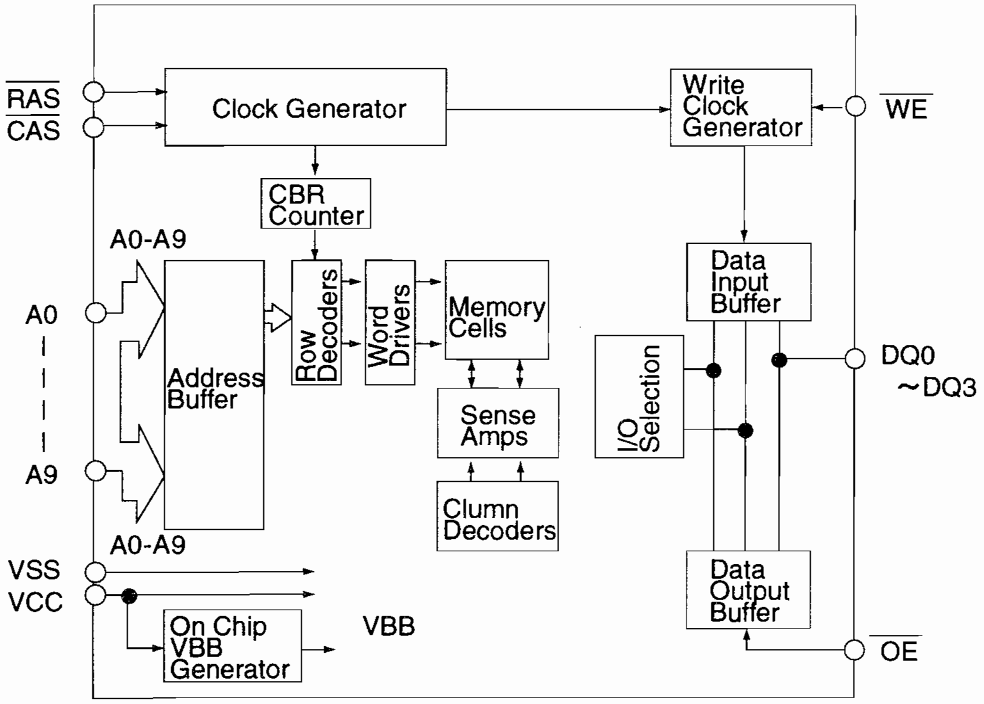
1.Pin Layout


DQ0 1
DQ1 2
$\overline{WE}$ 3
$\overline{RAS}$ 4
A9 5
A0 6
A1 7
A2 8
A3 9
VCC 10
11 A4
12 A5
13 A6
14 A7
15 A8
16 $\overline{OE}$
17 $\overline{CAS}$
18 DQ2
19 DQ3
20 VSS

2.Pin Functions

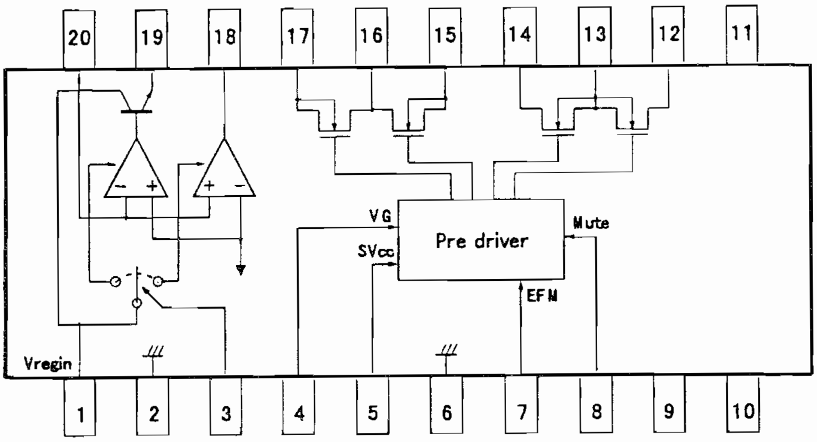
Symbol	Functions
A0-A9	Address Input
$\overline{RAS}$	Low Address strove
$\overline{CAS}$	Column Address Strove
$\overline{WE}$	Write enable Input
$\overline{OE}$	Output Enable Input
DQ0-DQ3	Data IN OUTPUT
VCC	Power Supply (+3.3V)
VSS	Power Supply (0V)
NC	Non Connect

3.Block Diagram


$\overline{RAS}$
$\overline{CAS}$
Clock Generator
Write Clock Generator
$\overline{WE}$
CBR Counter
A0-A9
A0
A9
Address Buffer
Row Decoders
Word Drivers
Memory Cells
Sense Amps
Clumn Decoders
I/O Selection
Data Input Buffer
DQ0 ~DQ3
A0-A9
VSS
VCC
On Chip VBB Generator
VBB
Data Output Buffer
$\overline{OE}$

■ BD7910FV-X(IC450):Pre driver

1.Block Diagram

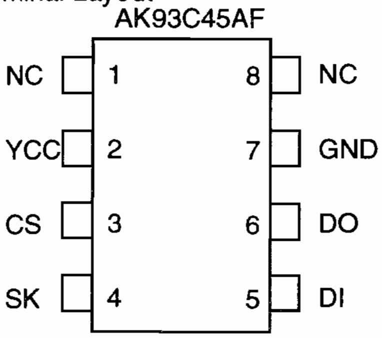


2.Pin Function

Pin No.	Symbol	I/O	Function	Pin No.	Symbol	I/O	Function
1	Vreg IN	I	Regulator input and regulator power supply	11	NC	-	Non connect
				12	VOD2	O	Sync.output (Lower power MOS,drain)
2	Reg GN	-	Regulator GND	13	VSS	-	"H"bridge GND (Lower power MOS,source)
3	NC	-	Non connect	14	VOD1	O	Sync.output (Lower power MOS,drain)
4	VG	I	Voltage input for power MOS drive	15	VOS1	O	Source output (Upper power MOS,source)
5	SVCC	O	EFM high level output voltage	16	VDD	-	"H" bridge power supply terminal (Upper power MOS,source)
6	PDGND	-	Pre-driver GND				
7	EFM	I	EFM signal input	17	VOS2	O	Source output (Upper power MOS,source)
8	MUTE	I	Mute control (Low active)	18	Reg DRV	O	External PNP drive output for regulator
9	NC	O	Non conncet	19	Reg OUT	O	Reglator output (Emitter follower output)
10	NC	O	Non connect	20	Reg NF	-	Regulator feedbaack terminal

■AK93C45AF-W(IC802):CMOS EEPROM

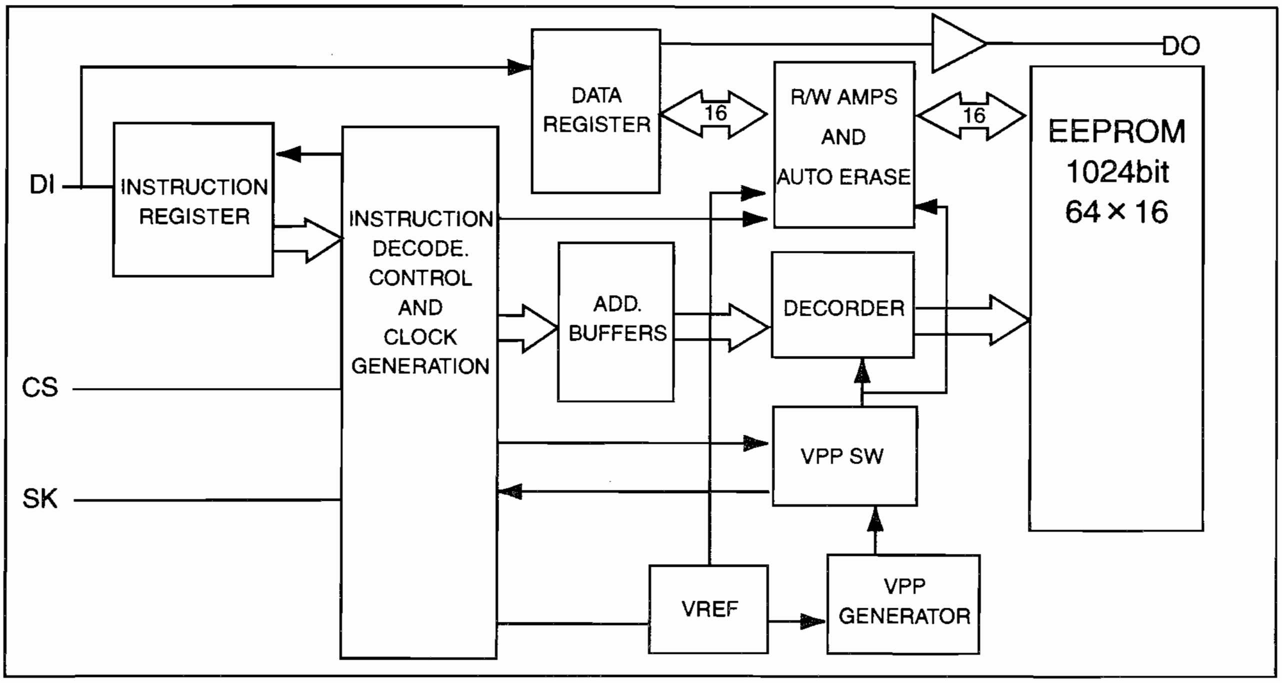
1.Terminal Layout


AK93C45AF
NC
1
8
NC
YCC
2
7
GND
CS
3
6
DO
SK
4
5
DI

2.Pin Functions

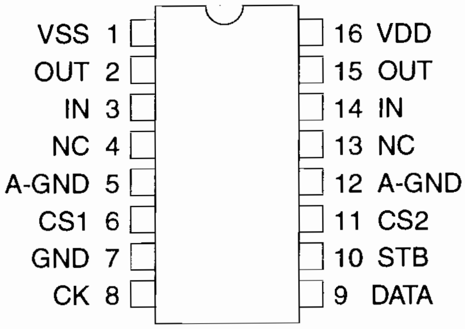
Symbol	Function
CS	Chip Select
SK	Serial Clock Input
DI	Serial Data Input
DO	Serial Data Output
Vcc	Power Supply
GND	Ground
NC	Non Connect

3.Block Diagram

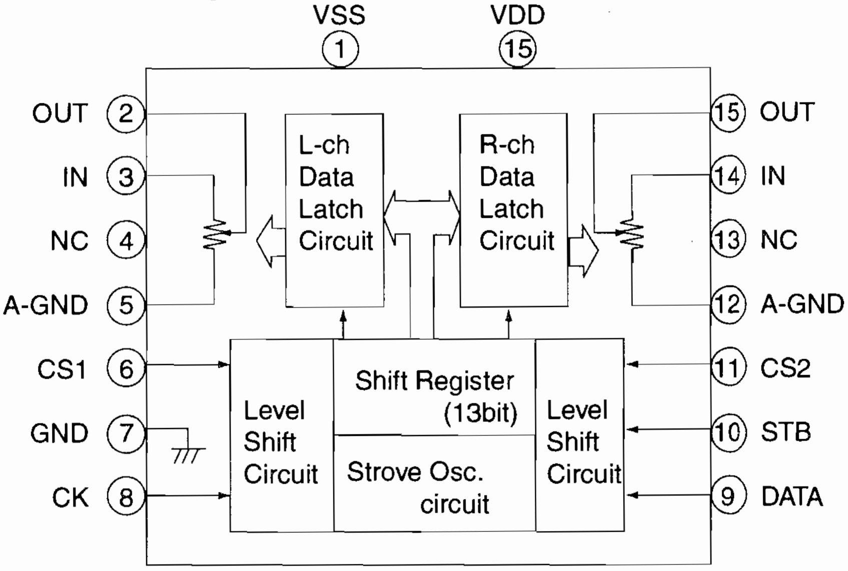

DI
CS
SK
INSTRUCTION REGISTER
INSTRUCTION DECODE. CONTROL AND CLOCK GENERATION
DATA REGISTER
16
R/W AMPS AND AUTO ERASE
16
DO
EEPROM 1024bit 64×16
ADD. BUFFERS
DECORDER
VPP SW
VREF
VPP GENERATOR

■TC9413AP (IC800) : Rec Level

1.Pin Layout


VSS 1
OUT 2
IN 3
NC 4
A-GND 5
CS1 6
GND 7
CK 8
16 VDD
15 OUT
14 IN
13 NC
12 A-GND
11 CS2
10 STB
9 DATA

2.Block Diagram

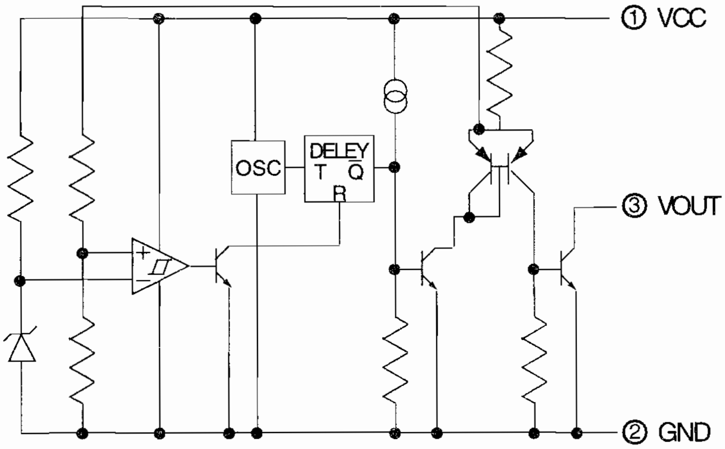

VSS
1
VDD
15
OUT 2
IN 3
NC 4
A-GND 5
CS1 6
GND 7
CK 8
L-ch Data Latch Circuit
R-ch Data Latch Circuit
Level Shift Circuit
Shift Register (13bit)
Strove Osc. circuit
Level Shift Circuit
15 OUT
14 IN
13 NC
12 A-GND
11 CS2
10 STB
9 DATA

3.Pin Functions

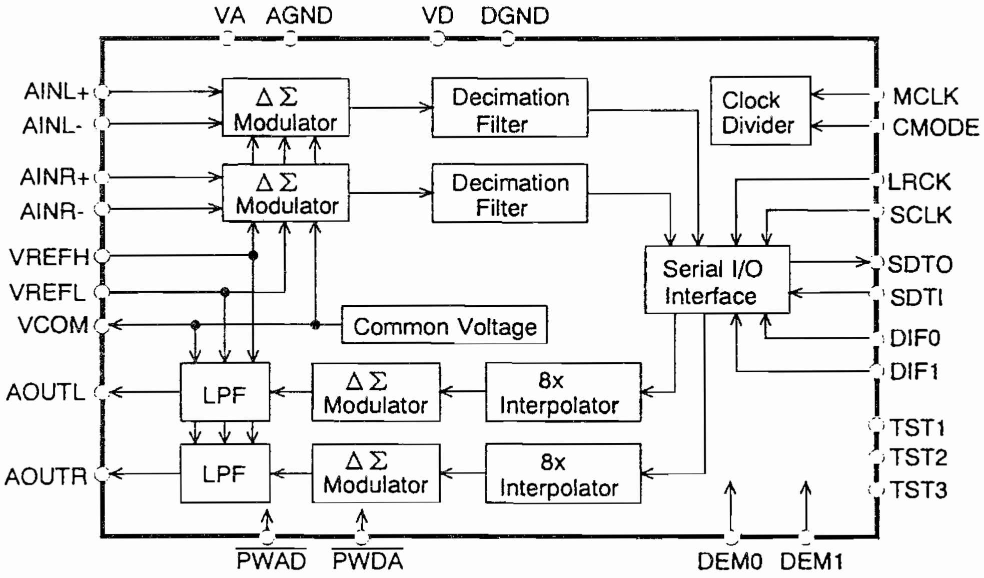
Pin No.	Symbol	Functions
1	VSS	- Power supply terminal
2	L-OUT	L-ch Volume output terminal
3	L-IN	L-ch Volume input terminal
4	NC	Non connection
5	L-A-GND	L-ch Analog ground
6	CS1	Chip select input terminal
7	GND	Digital ground
8	CK	Clock input terminal
9	DATA	Data input terminal
10	STB	Strove input terminal
11	CS2	Chip select terminal
12	R-A-GND	R-ch Analog ground
13	NC	Non connection
14	R-IN	R-ch Volume input terminal
15	R-OUT	R-ch Volume output terminal
16	VDD	+ power supply terminal

■IC-PST593/G/-T (IC240) : Reset IC

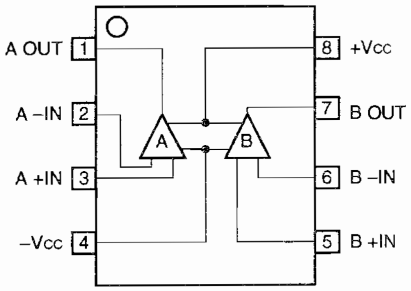
1.Pin Layout & Block Diagram


① VCC
③ VOUT
② GND
OSC
DELEY
T
Q
R

■ AK4520A-VF-X(IC480):A/D & D/A Converter

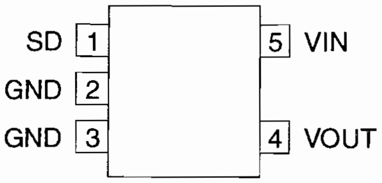

VA
AGND
VD
DGND
AINL+
AINL-
AINR+
AINR-
VREFH
VREFL
VCOM
AOUTL
AOUTR
ΔΣ Modulator
Decimation Filter
ΔΣ Modulator
Decimation Filter
Clock Divider
MCLK
CMODE
LRCK
SCLK
Serial I/O Interface
SDTO
SDTI
DIF0
DIF1
Common Voltage
LPF
ΔΣ Modulator
8x Interpolator
LPF
ΔΣ Modulator
8x Interpolator
TST1
TST2
TST3
PWAD
PWDA
DEM0
DEM1

■NJM4580D(IC220,IC750,IC850,IC870):Dual Ope. Amp

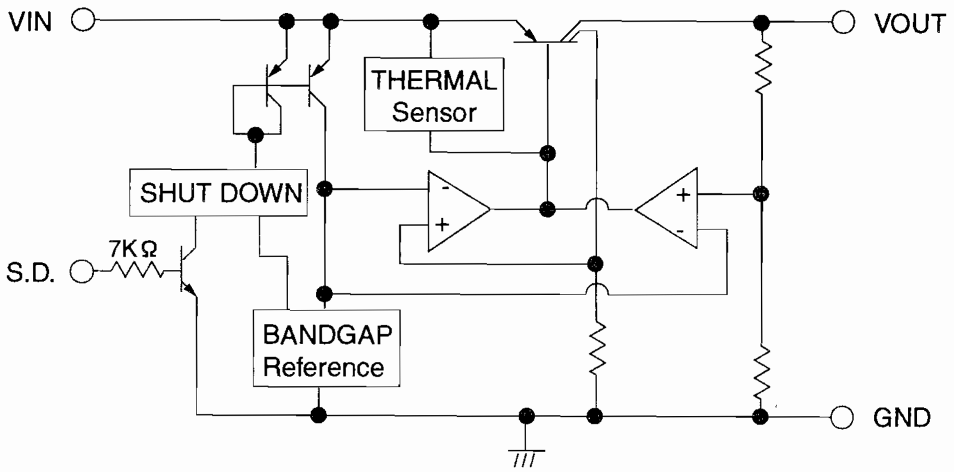

A OUT
1
A −IN
2
A +IN
3
−Vcc
4
8
+Vcc
7
B OUT
6
B −IN
5
B +IN
A
B

■TK71340M-W (IC485) : Regulator

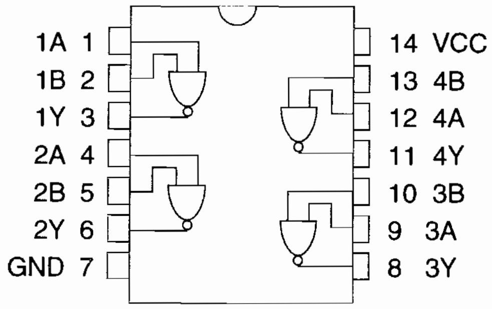
1.Pin Layout


SD 1
GND 2
GND 3
5 VIN
4 VOUT

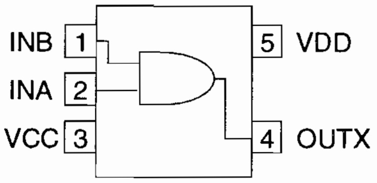
2.Block Diagram


VIN
VOUT
THERMAL Sensor
SHUT DOWN
7KΩ
S.D.
BANDGAP Reference
GND
-
+
+
-

■TC74HC00AP (IC280) : 2-Input Nand Gate

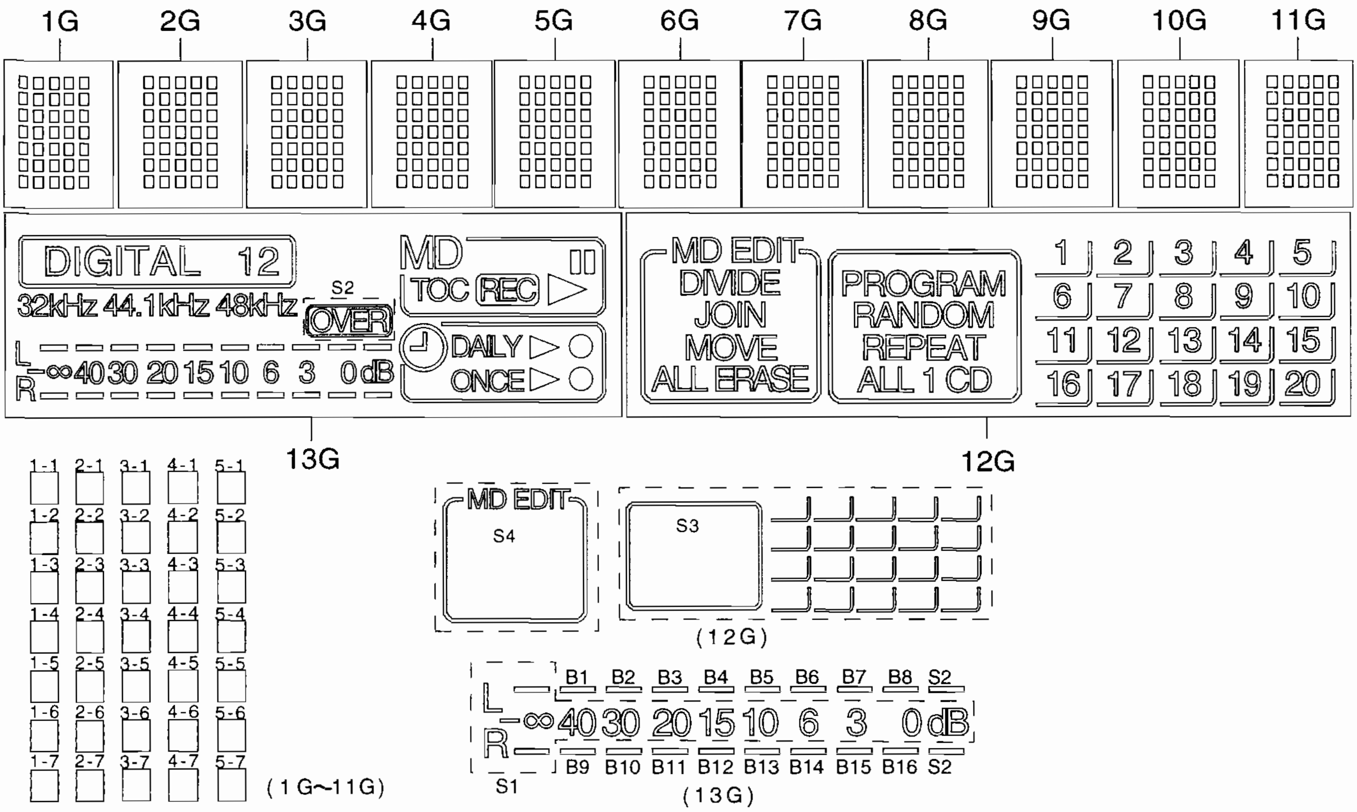

1A 1
1B 2
1Y 3
2A 4
2B 5
2Y 6
GND 7
14 VCC
13 4B
12 4A
11 4Y
10 3B
9 3A
8 3Y

■TC7S08F-W (IC340) : Single Ope. Amp


INB 1
INA 2
VCC 3
5 VDD
4 OUTX

Internal Connections of FL Display Tube

■QLF0052-001 : FL DISPLAY TUBE


1G
2G
3G
4G
5G
6G
7G
8G
9G
10G
11G
DIGITAL 12
32kHz 44.1kHz 48kHz
S2
OVER
L
R
-∞40 30 20 15 10 6 3 0dB
MD
TOC
REC
DAILY
ONCE
MD EDIT
DIVIDE
JOIN
MOVE
ALL ERASE
PROGRAM
RANDOM
REPEAT
ALL 1 CD
1 2 3 4 5
6 7 8 9 10
11 12 13 14 15
16 17 18 19 20
13G
12G
1-1 2-1 3-1 4-1 5-1
1-2 2-2 3-2 4-2 5-2
1-3 2-3 3-3 4-3 5-3
1-4 2-4 3-4 4-4 5-4
1-5 2-5 3-5 4-5 5-5
1-6 2-6 3-6 4-6 5-6
1-7 2-7 3-7 4-7 5-7
(1G~11G)
MD EDIT
S4
S3
(12G)
B1 B2 B3 B4 B5 B6 B7 B8 S2
L
R
-∞40 30 20 15 10 6 3 0dB
B9 B10 B11 B12 B13 B14 B15 B16 S2
S1
(13G)

	1G~11G	12G	13G
P1	1-1	1	S2
P2	2-1	2	S1
P3	3-1	3	B16
P4	4-1	4	B15
P5	5-1	5	B14
P6	1-2	6	B13
P7	2-2	7	B12
P8	3-2	8	B11
P9	4-2	9	B10
P10	5-2	10	B9
P11	1-3	11	B8
P12	2-3	12	B7
P13	3-3	13	B6
P14	4-3	14	B5
P15	5-3	15	B4
P16	1-4	16	B3
P17	2-4	17	B2
P18	3-4	18	B1

	1G~11G	12G	13G
P19	4-4	19	ONCE
P20	5-4	20	DAILY
P21	1-5	S3	▷ (LOWER)
P22	2-5	PROGRAM	▷ (UPPER)
P23	3-5	-	○ (LOWER)
P24	4-5	-	○ (UPPER)
P25	5-5	RANDOM	TOC
P26	1-6	REPEAT	REC
P27	2-6	ALL (1 CD)	▷ (REC)
P28	3-6	1 (ALL CD)	▯▯
P29	4-6	CD	MD
P30	5-6	S4	48kHz
P31	1-7	DIVIDE	44.1kHz
P32	2-7	JOIN	32kHz
P33	3-7	MOVE	(DIGITAL) 2
P34	4-7	ALL (ERASE)	1
P35	5-7	ERASE	DIGITAL
P36	-	-	◷

Pin No.	Conn-ection	Pin No.	Conn-ection	Pin No.	Conn-ection
1	F1	37	P12	73	NP
2	F1	38	P11	74	NP
3	F1	39	P10	75	NP
4	NP	40	P9	76	NP
5	NP	41	P8	77	NP
6	P36	42	P7	78	NP
7	P35	43	P6	79	NP
8	P34	44	P5	80	NP
9	P33	45	P4	81	NP
10	P32	46	P3	82	NP
11	P31	47	P2	83	NP
12	P30	48	P1	84	NP
13	P29	49	NP	85	NP
14	P28	50	NP	86	NP
15	P27	51	F2	87	NP
16	P26	52	F2	88	NP
17	P25	53	F2	89	NP
18	P24	54	NP	90	NP
19	P23	55	NP	91	NP
20	P22	56	NP	92	NP
21	P21	57	NP	93	NP
22	P20	58	NP	94	NP
23	NP	59	IC	95	NP
24	NP	60	13G	96	NP
25	NP	61	12G	97	NP
26	NP	62	11G	98	1G
27	NP	63	10G	99	NC
28	NP	64	9G	100	NC
29	IC	65	8G	101	NC
30	P19	66	7G	102	NP
31	P18	67	6G	103	NP
32	P17	68	5G	104	NP
33	P16	69	4G	105	NP
34	P15	70	3G	106	NP
35	P14	71	2G		
36	P13	72	NP		

Removal of Main Parts

< Main body >

■Removing the Top Cover (see Fig.1~3)

1. From the left side of the body, remove the two screws A attaching the top cover.

2. From the right side of the body, remove the two screws B attaching the top cover.

3. From the rear body, remove the two screws C attaching the top cover.

4. Remove the top cover upward from the rear body while pulling lower parts of the sides of the top cover.

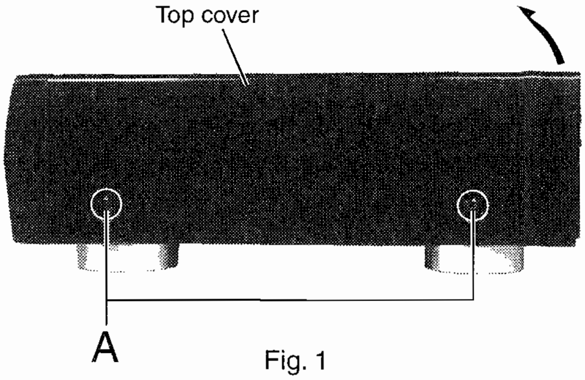


Fig. 1

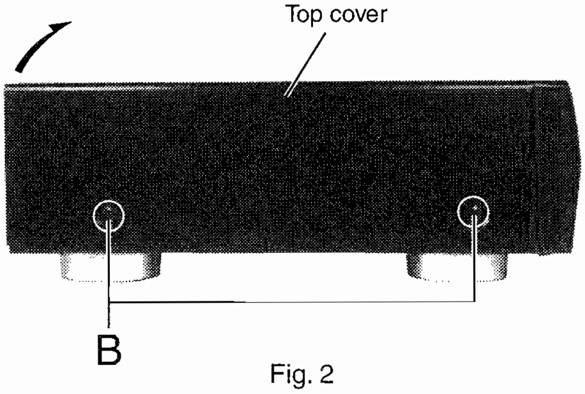


Fig. 2

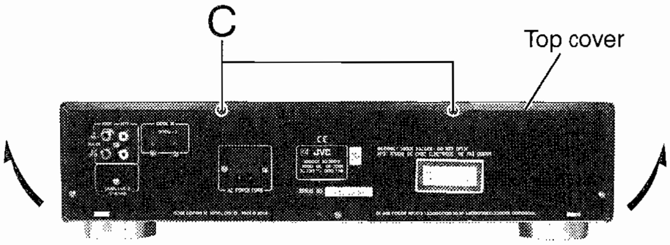


Fig. 3

■ Removing the MD Mechanism Assembly (see Fig.4)

1. Remove the four screws D attaching the MD mechanism assembly.

2. Disconnect the card wire connected to connector CN489 on the audio board.

3. Detach the MD mechanism assembly.

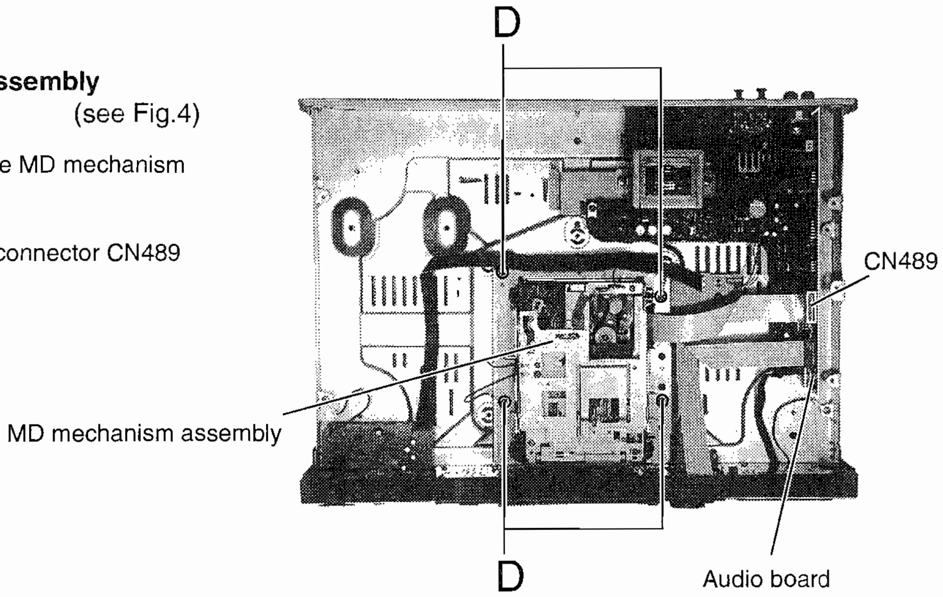

D
CN489
MD mechanism assembly
D
Audio board

Fig. 4

■ Removing the Front Panel Assembly

(see Fig.5 - 8)

1. Remove the two screws E attaching the two earth lug wires (black) connected from both sides of the front panel assembly to the chassis base in the bottom of the body.
2. Disconnect the card wires connected to connector CN103 on the main board, connector CN214 on the relay board and connector CN201 on the audio board respectively.
3. From the bottom of the body, remove the three screws F attaching the front panel assembly.
4. Release two joint (a)s on both sides of the front panel assembly and joint (b) in the bottom by using a screwdriver. Detach the front panel assembly toward the front.

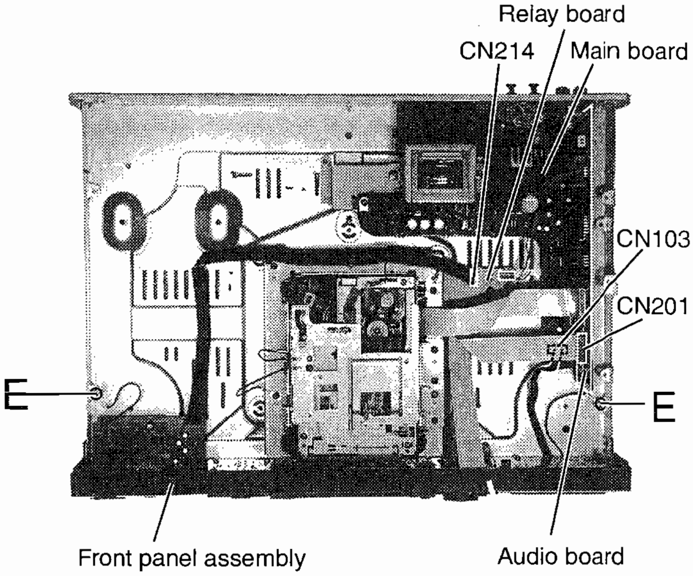

Relay board
CN214
Main board
CN103
CN201
E
E
Front panel assembly
Audio board

Fig. 5

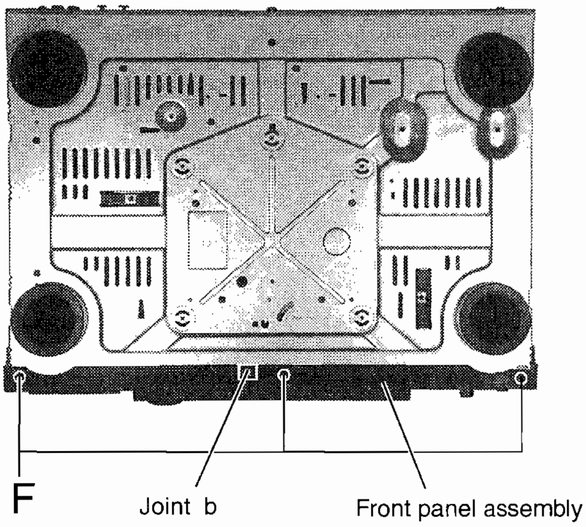

F
Joint b
Front panel assembly

Fig. 6

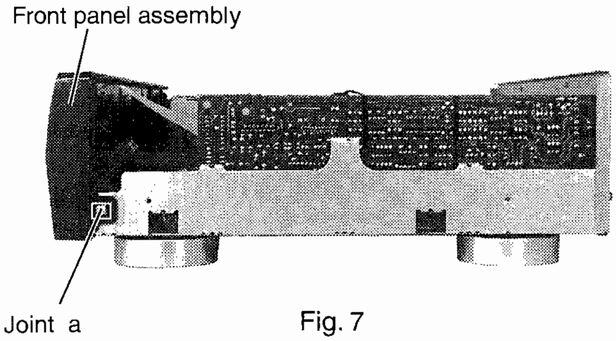

Front panel assembly
Joint a

Fig. 7

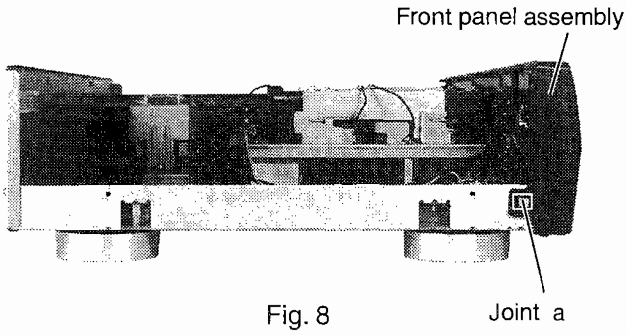

Front panel assembly
Joint a

Fig. 8

■ **Removing the Relay Board** (see Fig. 9)

1. Remove the one screw G attaching the relay board.
2. Disconnect the card wire connected to connector CN214 on the relay board, then disconnect the harness connected to connector CN215 on the relay board.

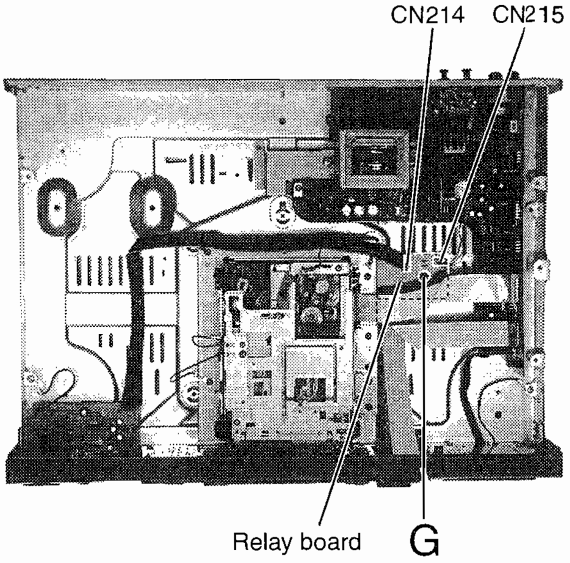

CN214
CN215
Relay board
G

Fig. 9

■ **Removing the Main Board and the Audio Board** (see Fig. 10 and 11)

1. Disconnect the card wires and harnesses connected to connector CN103 on the main board, connector CN215 on the relay board, connector CN201, CN489 and CN202 on the audio board respectively.
2. From the rear body, remove the two screws J attaching the main board and two screws K attaching the Audio board.
3. Disconnect connector CN101 and CN102 on the main board, then detach the Audio board upward.
4. Remove the three screws H attaching the main board and the two screws I attaching the transformer unit.

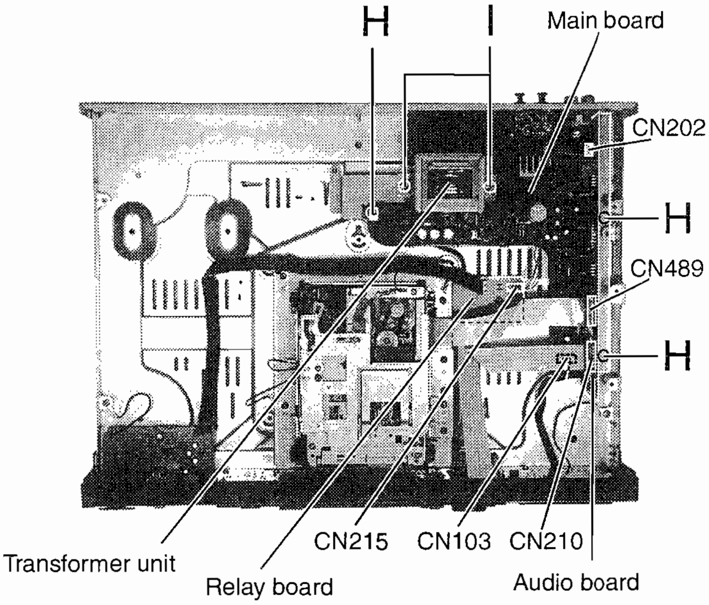

H
I
Main board
CN202
H
CN489
H
Transformer unit
CN215
CN103
CN210
Relay board
Audio board

Fig. 10

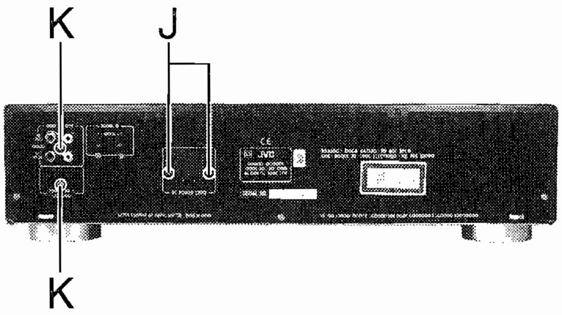


Fig. 11

■ **Removing the Digital Board** (see Fig. 12 and 13)

1. Disconnect the card wire connected to connector CN202 on the audio board.

2. From the rear body, remove the two screws L attaching the digital board.

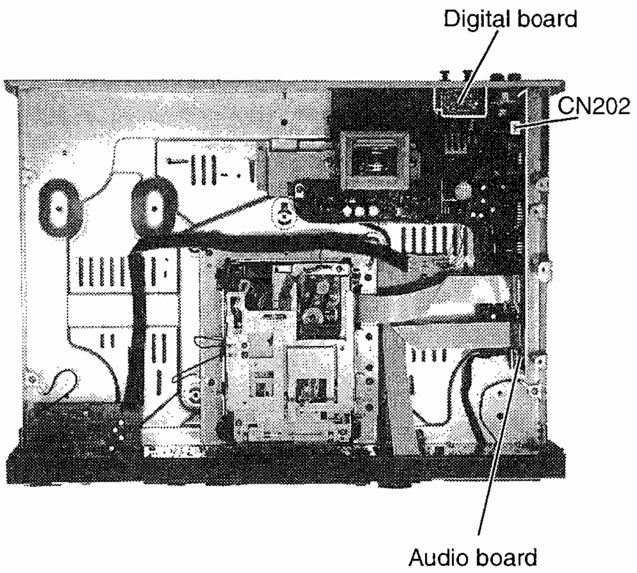

Digital board
CN202
Audio board

Fig. 12

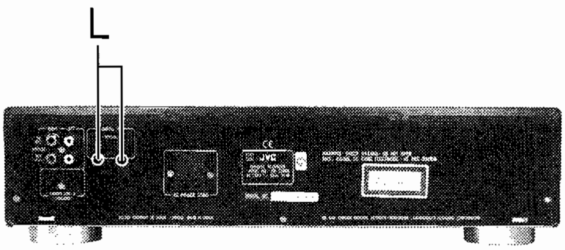


Fig. 13

Removing the Jog Dial Board
(see Fig.14 and 15)

1. Detach the front panel assembly from the body.
2. Draw the jog dial toward the front, then detach the jog dial board from the front panel assembly.
3. Remove the two screws M attaching the jog dial board.

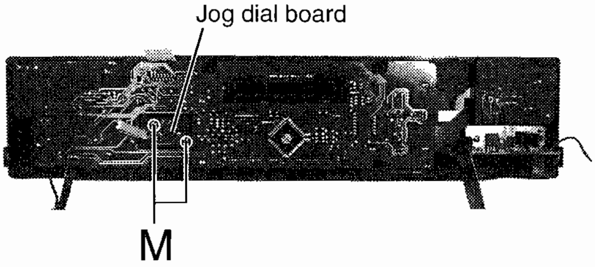


Fig. 14

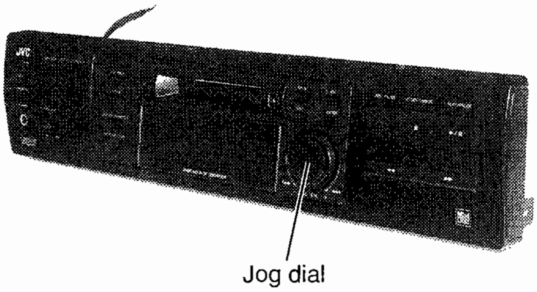


Fig. 15

Removing the System Micon Board (see Fig.16)

1. Detach the front panel assembly from the body.
2. Detach the jog dial board.
3. Remove the eleven screws N attaching the System Micon board.
4. Disconnect the card wire connected to connector CN303 on the System Micon board.

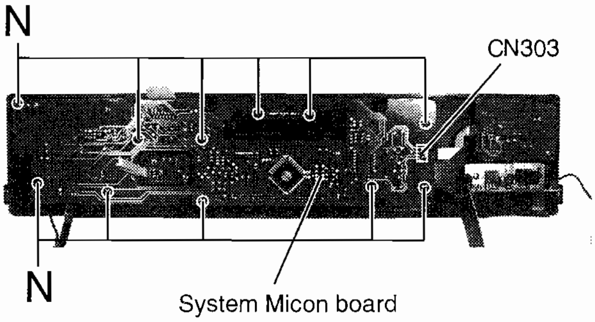


Fig. 16

Removing the Power Switch Board (see Fig.16)

1. Detach the front panel assembly from the body.
2. Remove the twelve screws O attaching the power switch board.
3. Disconnect the card wire connected to connector CN313 on the power switch board.

Removing the Headphone Amplifier Board
(see Fig.15 and 17)

1. Detach the front panel assembly from the body.
2. Pull out the dial toward the front.
3. Remove the two screws P attaching the Phones amplifier board.
4. Remove the Phones amplifier board with the bracket.

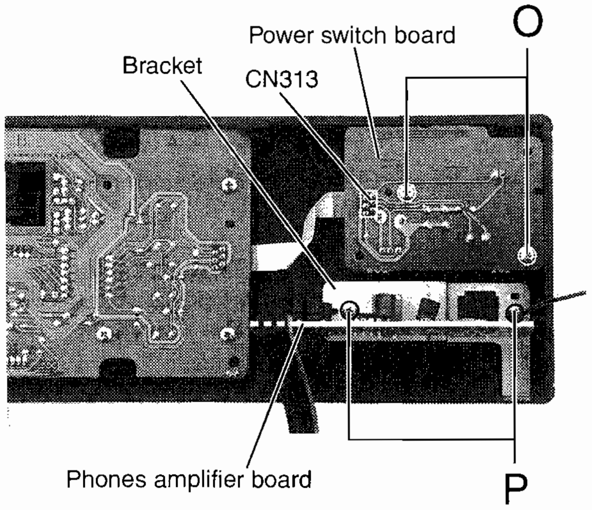


Fig. 17

< MD Mechanism Assembly >

■ Removing the MD Mechanism assembly (see Fig.1)

1. From the right side of the MD mechanism, remove the three screw As attaching the side bracket.

2. Remove the four dampers in the corners of the MD mechanism.

3. Slide and remove the side bracket and MD mechanism base in the directions of the arrows.

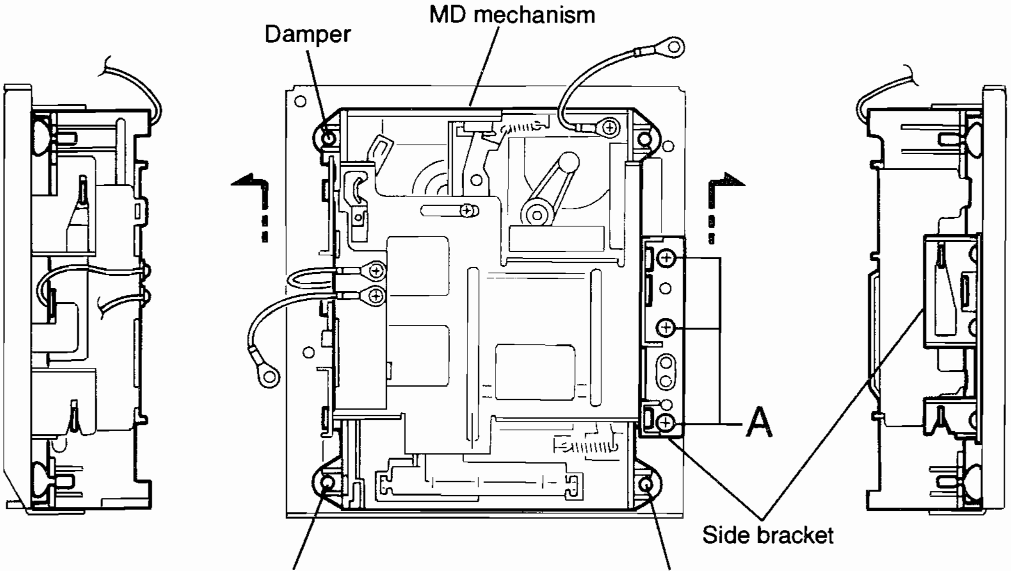

Damper
MD mechanism
A
Side bracket
Damper
Damper

Fig. 1

■ Removing the MD Servo Board (see Fig.2)

1. Remove the MD mechanism assembly.

2. Turn over the MD mechanism, then disconnect the harnesses connected to connector CN407 and CN408 on the MD servo board.

3. Disconnect the flexible wire connected to connector CN521 on the MD servo board (see Fig.2-2).

4. Remove the two screw Bs attached on the reverse side of the MD mechanism.

5. Solder the patterns on the pickup unit as shown in the Fig.2-1, and disconnect the flexible wire connected to connector CN321 on the MD servo board.

   Caution: Make sure to solder the patterns to prevent damage to the pickup unit.

6. Remove the MD servo board upward while pulling out (a) inserted to the front holder of the MD servo board toward the rear.

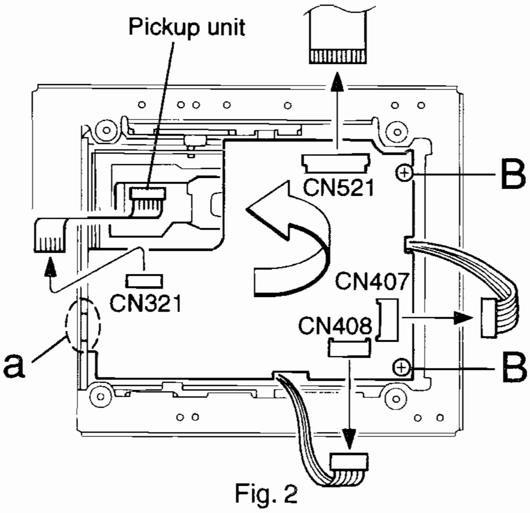

Pickup unit
CN521
B
CN407
CN321
CN408
a
B

Fig. 2

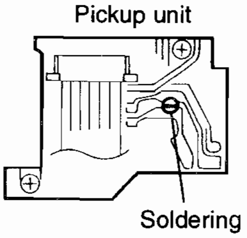

Pickup unit
Soldering

Fig. 2-1

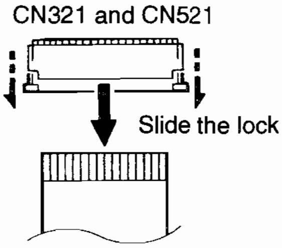

CN321 and CN521
Slide the lock

Fig. 2-2

■Removing the MD traverse mechanism (see Fig.3,4)

1. Remove the MD mechanism assembly.
2. Remove the MD servo P.C.board.
3. Remove the one screw C attaching the slide bracket.
4. Remove the one screw D attaching the earth lag terminal.
5. Remove the two screws E attaching the MD traverse mechanism, then remove the bracket.
6. Remove the soldered two wires from magnetic head on loading P.C.board.

[CAUTION]

1. When remove the MD mechanism, take care the handling of the magnetic head. Do not broken by hanging other parts.
2. Confirm the pickup is inside position, if remove the pick up at the outside magnetic head hang the other parts.

7. Slide and remove the bracket, then remove the MD traverse mechanism.

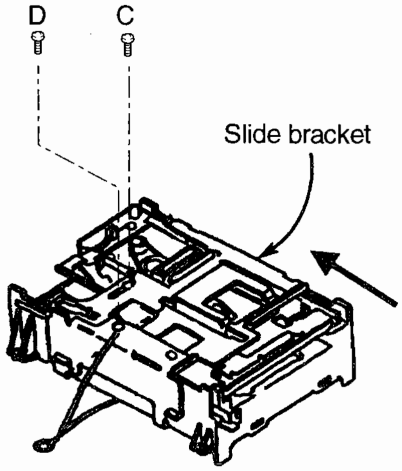

D
C
Slide bracket

Fig.3

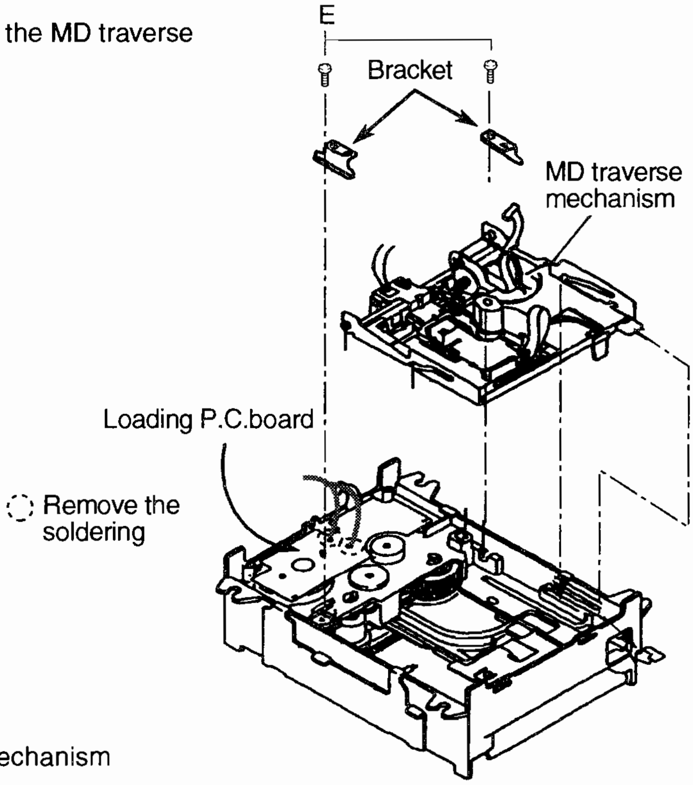

E
Bracket
MD traverse mechanism
Loading P.C.board
Remove the soldering

Fig.4

■Caution of reassemble MD traverse mechanism

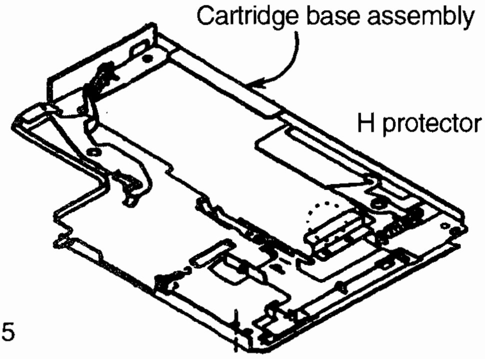
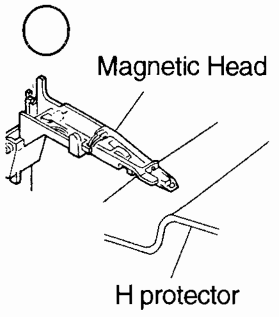
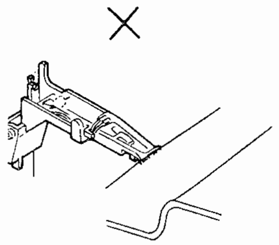

Cartridge base assembly
H protector

Fig.5

Care to cartridge base assembly do not hang the magnetic head


○
Magnetic Head
H protector

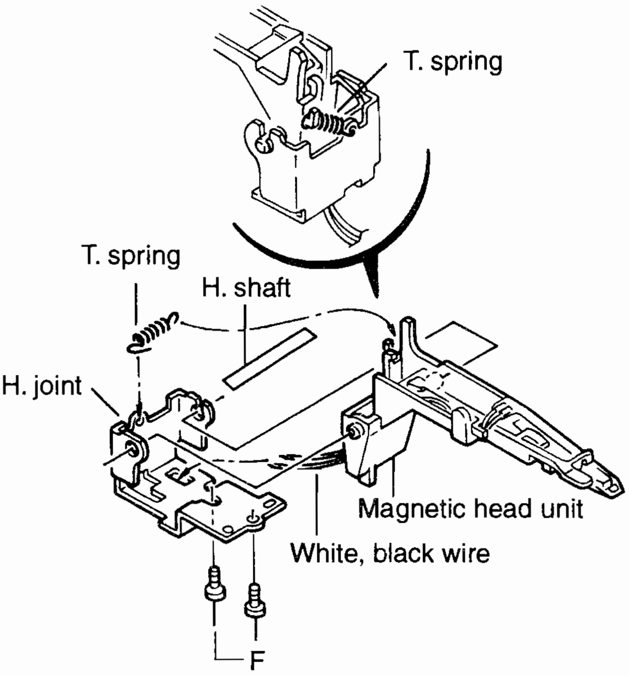


Care to H protector do not over the magnetic head

■Removing the magnetic head (see Fig.6 and 7)

1. Remove the MD traverse mechanism.
2. Remove the two screws F attaching the H. joint.
3. Extract the magnetic head, in this time do not touch the lens.
4. Pull out the H. shaft the other side of T. spring.

[CAUTION]
When attach the H. shaft, take care the shaft push in at bent.
Magnetic head to out of position.


T. spring
T. spring
H. shaft
H. joint
Magnetic head unit
White, black wire
F

■Removing the MD pick up (see Fig.6 to 8)

1. Remove the MD traverse mechanism.
2. Remove the two screws F attach the magnetic head unit. (see Fig.6)
3. Remove the hook, then remove the pick up with the guide shaft to the arrow way.

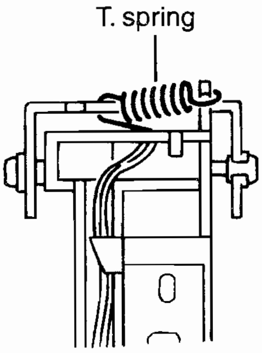


Fig.7

■Reassembly the MD pick up (see Fig.8)

1. Attach the part of **a** of the pick up to the guide then attach the guide shaft.
2. Confirm the hook fixing the guide shaft.

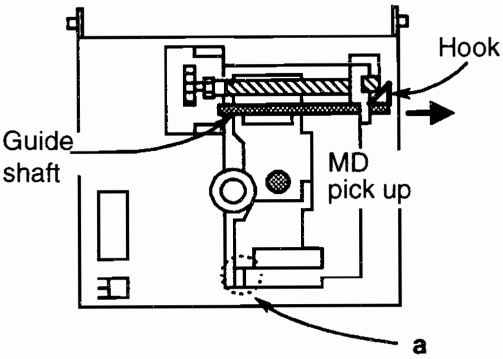

Hook
Guide shaft
MD pick up
a

Fig.8

■Removing the feed motor assembly (see Fig.9)

1. Remove the traverse mechanism.
2. Turnover the MD traverse mechanism, then remove the soldering two wires attach the P.C.board. (White and black wires)
3. Remove the one screw G attach the motor bracket.
4. Remove the food from the chassis base, then remove the feed motor assembly.

■Removing the spindle motor assembly (see Fig.6 to 9)

1. Remove the MD traverse mechanism.
2. Pull up the tern table assembly.
3. Turnover the MD traverse mechanism, then remove the soldering two wires attach the P.C. board. (Red and black wires)
4. Remove the two screws H attach the spindle motor.

[CAUTION]
When change the spindle motor, tarn table assembly should change together.
Tarn table assembly can not reuse.

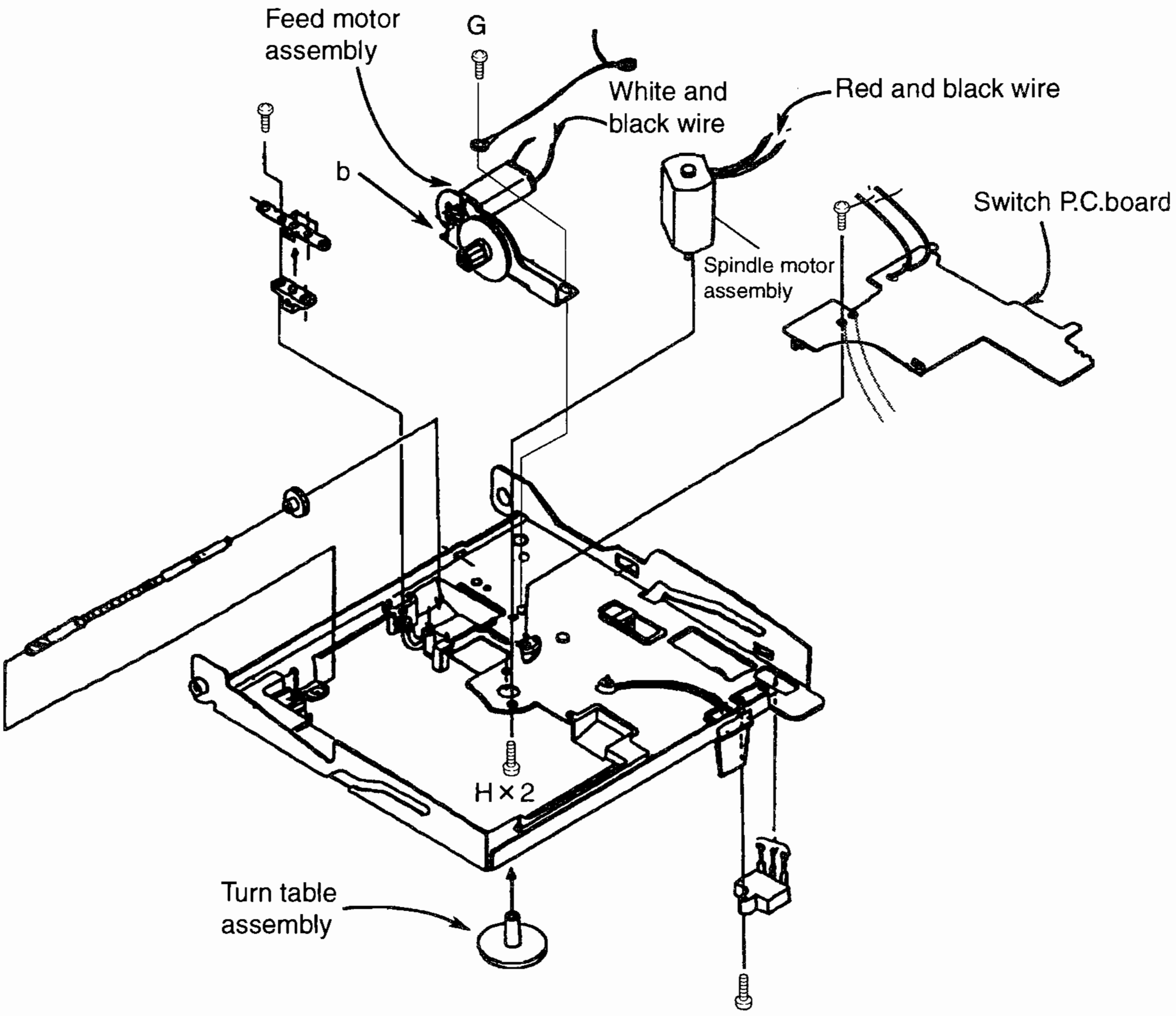

Feed motor assembly
G
White and black wire
Red and black wire
b
Switch P.C.board
Spindle motor assembly
H×2
Turn table assembly

Fig.9

■Removing the slide bracket (see Fig.10)

1. Remove the MD mechanism
2. Remove the two screws I attaching the slide bracket (L).
3. Remove the slide bracket (L), then remove the slide bracket (R).

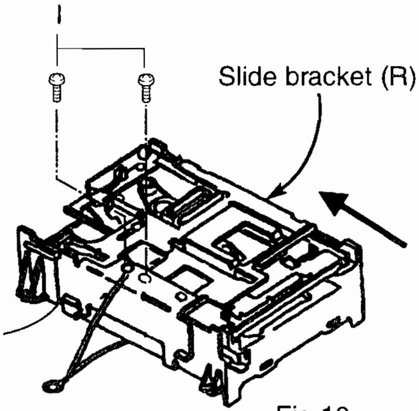

I
Slide bracket (R)
Slide bracket (L)

Fig.10

■Removing the car. base assembly (see Fig.11 to 13)

1. Remove the MD mechanism assembly, then remove the MD servo P.C.board.
2. Remove the slide bracket (L) and slide bracket (R).
3. Remove the three screws J attaching the car. base assembly, then remove the car. base assembly and lack.

> [CAUTION]
> When reassembly the car. base assembly and lack, according Fig.12 and 13.

[Attaching the lack]
Through the hook of the shutter lever as follow the fig.11

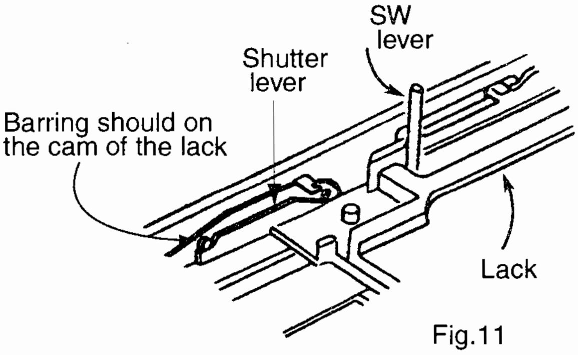

SW lever
Shutter lever
Barring should on the cam of the lack
Lack

Fig.11

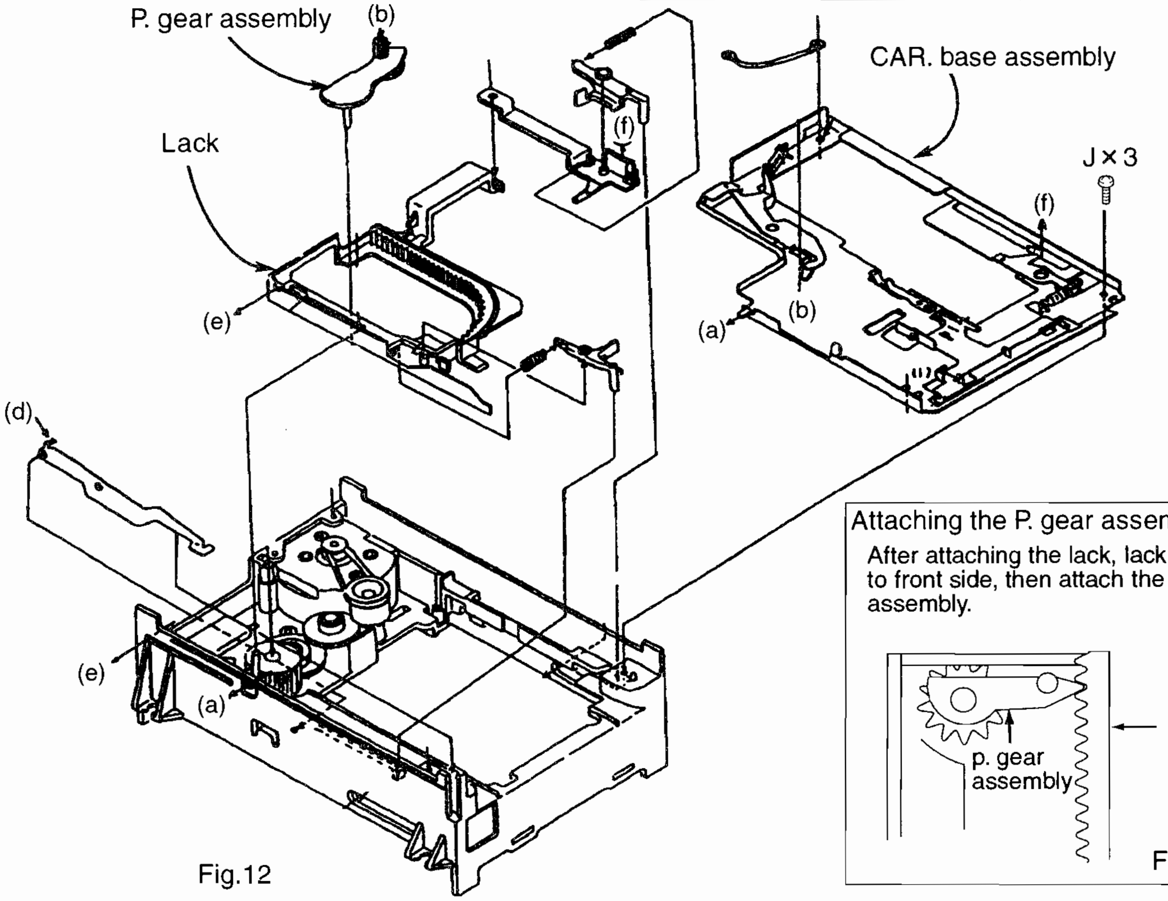

P. gear assembly
(b)
Lack
(f)
CAR. base assembly
J×3
(f)
(e)
(a)
(b)
(d)
(e)
(a)

Fig.12

Attaching the P. gear assembly

After attaching the lack, lack full shift to front side, then attach the P. gear assembly.

Lack gear
p. gear assembly

Fig.13

Removing the loading base assembly (see Fig.14)

1. Remove the car. base assembly and lack.
2. Remove the two screws K attaching the loading motor.
3. Remove the soldering loading motor assembly on the loading P.C.board.

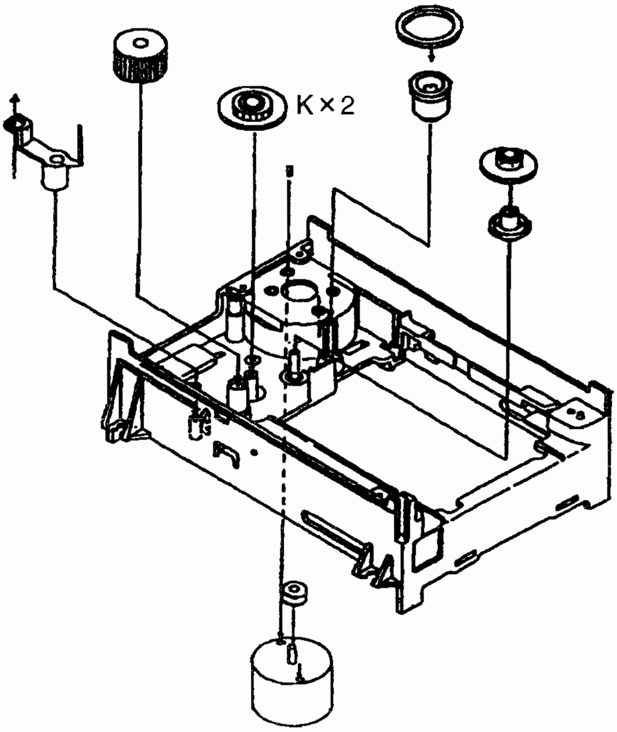
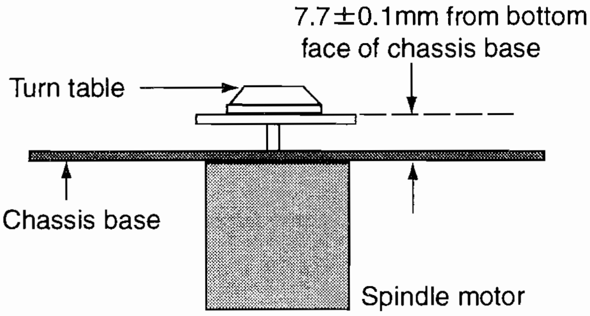

K×2
Loading motor assembly

Fig.14

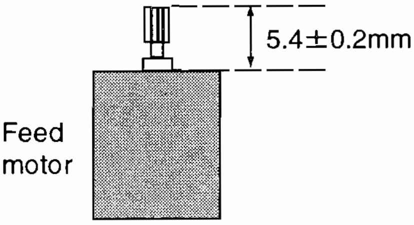
Attaching the parts for each motors (see Fig.15 to 17)

1. Attach the turn table assembly to spindle motor is according Fig.15.
2. Attach the gear to feed motor is according Fig.16.
3. Attach the pulley to loading motor is according Fig.17.


7.7±0.1mm from bottom face of chassis base
Turn table
Chassis base
Spindle motor

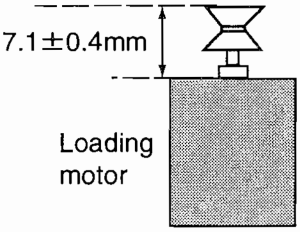
Attachment of turn table

Fig.15


5.4±0.2mm
Feed motor

Attachment of gear

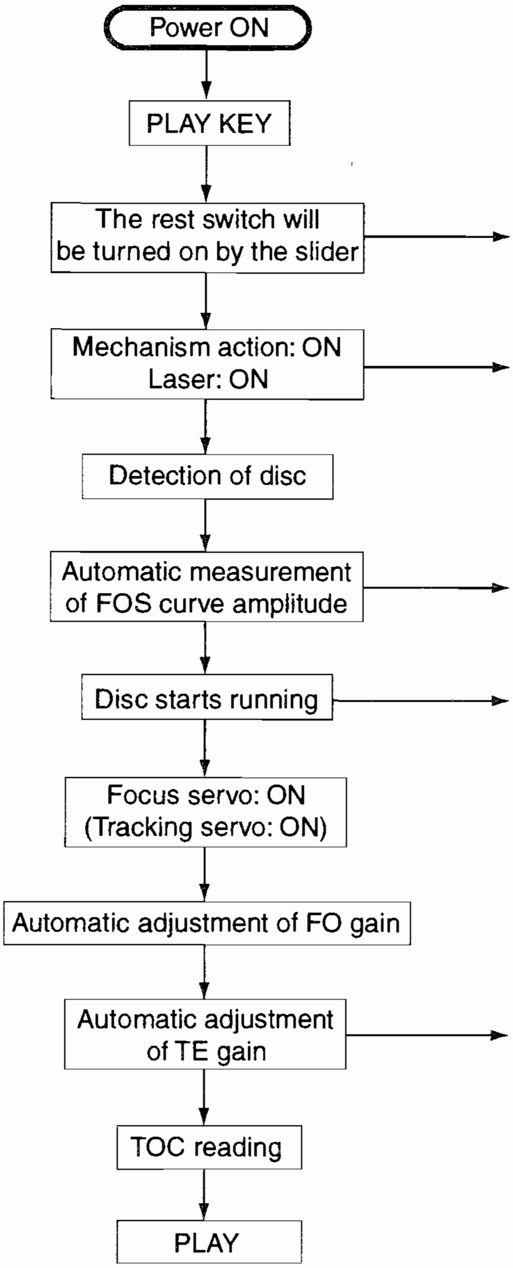
Fig.16


7.1±0.4mm
Loading motor

Attachment of pulley

Fig.17

Flow of Functional Operation Until TOC Read


Power ON
PLAY KEY
The rest switch will be turned on by the slider
Mechanism action: ON
Laser: ON
Detection of disc
Automatic measurement of FOS curve amplitude
Disc starts running
Focus servo: ON
(Tracking servo: ON)
Automatic adjustment of FO gain
Automatic adjustment of TE gain
TOC reading
PLAY

Confirm that the voltage at CN400 4pin is V (The voltage will become 0V when the switch as been turned on).

Confirm that the voltage at IC450 5pin is 5V.

Confirm that the focus error S. curve signal (about 2Vpp) is output to IC310 35pin.

Confirm that IC400 8pin becomes 0V from VREF or about 400msec. as an acceleration pulse.

Confirm that the eye pattern is output to IC310 41pin.

Maintenance of Laser Pickup

1. Cleaning of pickup lens

(1) Prior to changing the pickup, clean the pickup lens.

(2) For cleaning the lens, use the following cotton swab after mearsing it in alcohol.

Product No. JCB-B4; Manufacturer;Nippon Cotton Swab

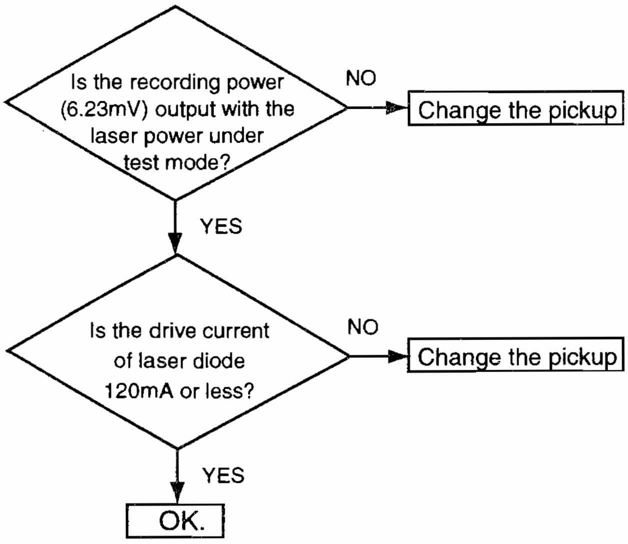
2. Confirmation of the service life of laser diode when the service life of the laser diode has been exhausted, the following symptoms will appear.

(1) Recording will become impossible.

(2) The RF output (EFM output and eye pattern amplitude) will become lower.

(3) The drive current required for light emitting of laser diode will be increased.

Confirm the service life according to the following flow chart:

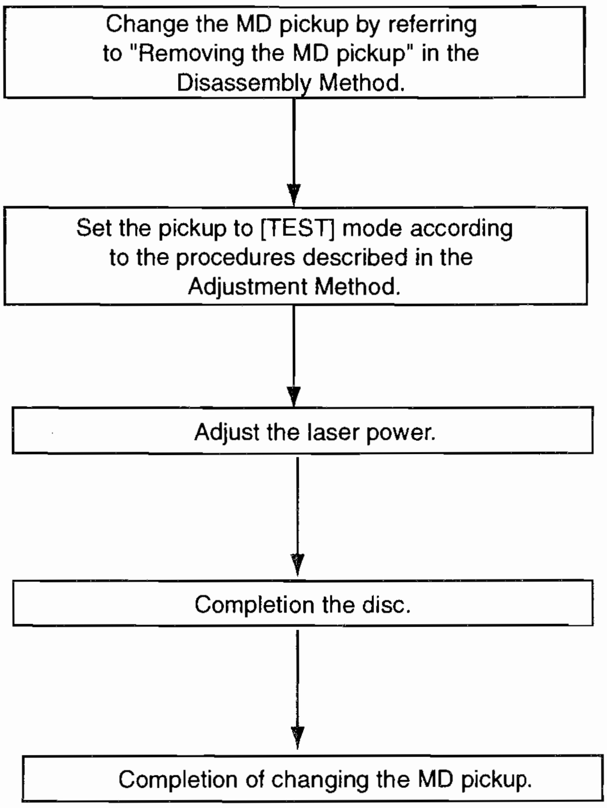

Is the recording power (6.23mV) output with the laser power under test mode?
NO
Change the pickup
YES
Is the drive current of laser diode 120mA or less?
NO
Change the pickup
YES
OK.

3. Method of measuring the drive current of laser diode

When the voltage measured at TP ILCC (Q301 emitter) and +5V (Q303 emitter) of the MD servo P.C. board (ENX-0223) have become 600mV or over, the service life of the laser diode is judged to have been exhausted.

[Caution] When TP ILCC (Q301 collector) and +5V (Q303 emitter have been is short circuit on such an occasion, then the laser diode will be broken. Therefore, take utmost care in handling the MD pickup.

Replacement of Laser pickup


Change the MD pickup by referring to "Removing the MD pickup" in the Disassembly Method.
Set the pickup to [TEST] mode according to the procedures described in the Adjustment Method.
Adjust the laser power.
Completion the disc.
Completion of changing the MD pickup.

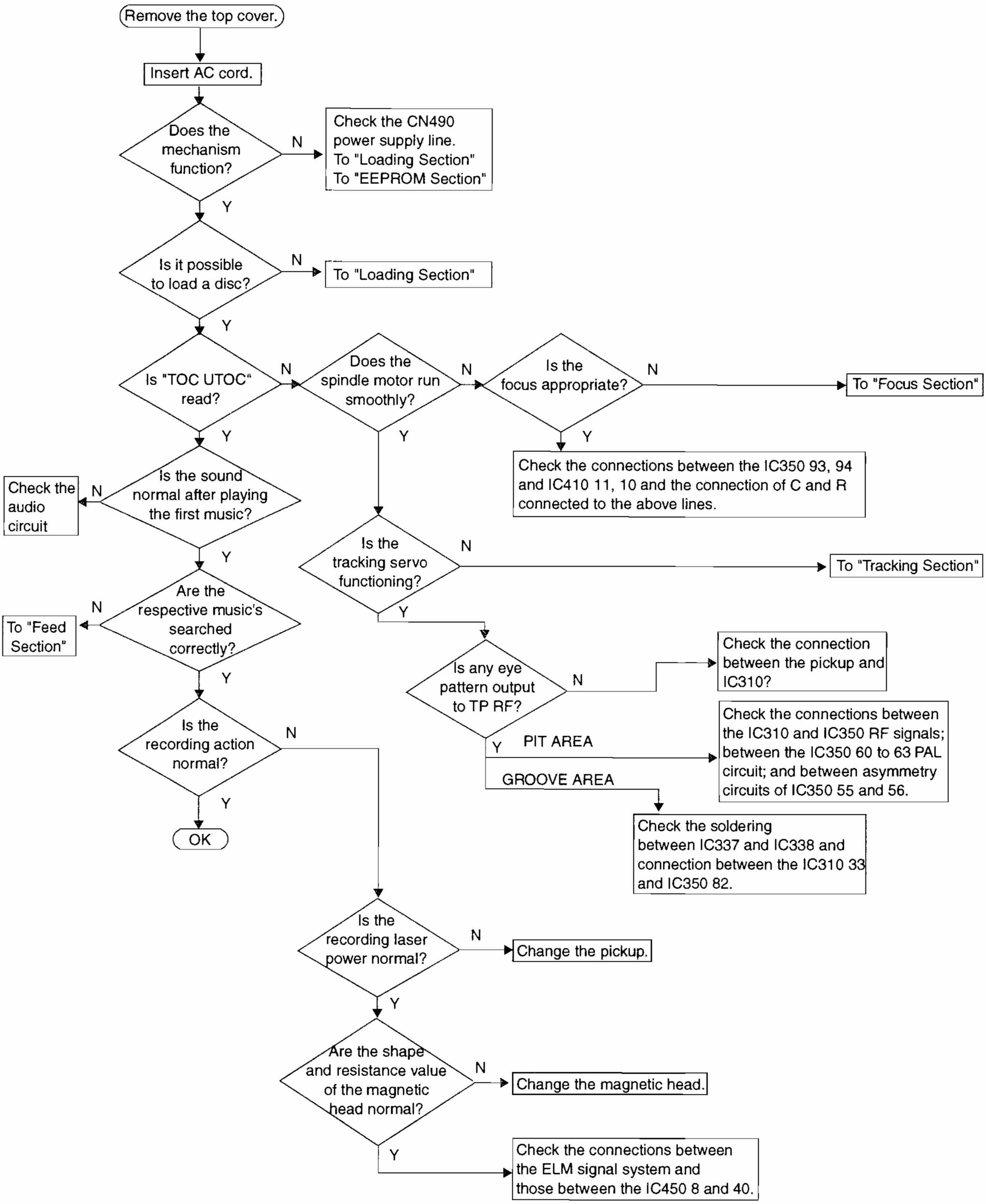
★Since this system is designed to perform magnetic recording, the laser power ten times or over of the conventional MD player will be output. Therefore, be sure to perform not only adjustment and operation of this system so carefully as not to directly look at the laser beam or touch on the body.

4. Semi-solid state resistors on the APC P.C. board

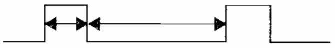
The semi-solid state resistor on the APC P.C.board attached to the pickup is used for adjusting the laser power. Since these resistor should be adjusted in pair according to the characteristics of the optical block, be sure not to touch on the resistors.

Since the service life of the laser diode will be exhausted when the laser power is low, it is necessary to change the pickup. Meanwhile, do not pickup. Otherwise, the pickup will be damaged due to over current.

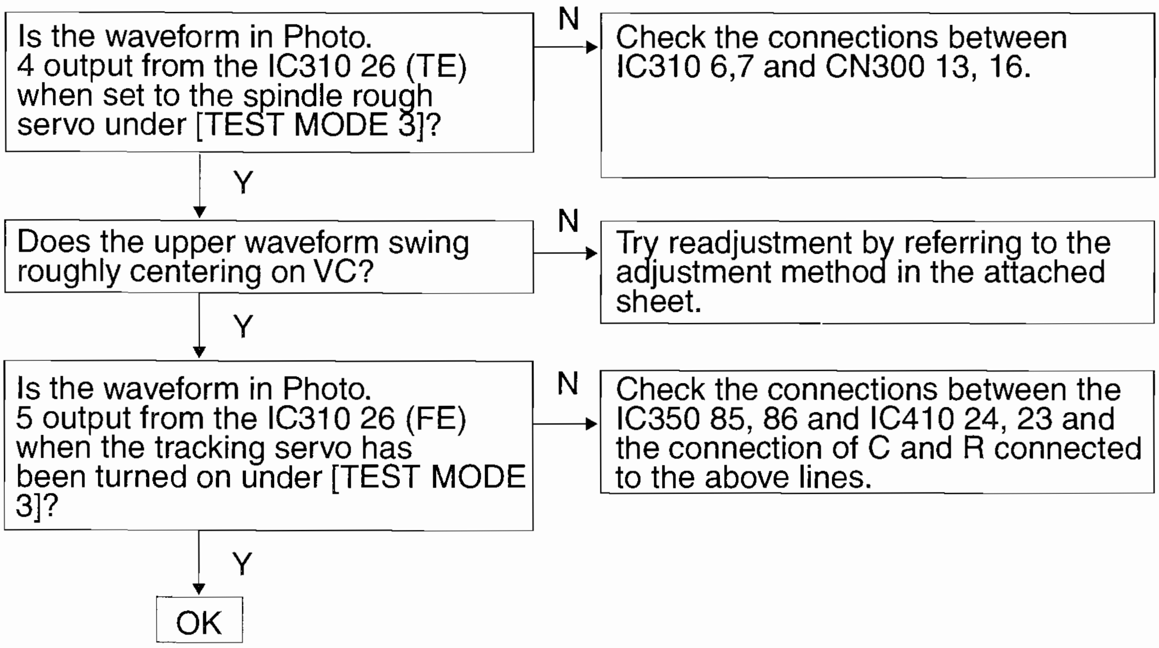
Procedures for repairing


Remove the top cover.
Insert AC cord.
Does the mechanism function?
N
Check the CN490 power supply line.
To "Loading Section"
To "EEPROM Section"
Y
Is it possible to load a disc?
N
To "Loading Section"
Y
Is "TOC UTOC" read?
N
Does the spindle motor run smoothly?
N
Is the focus appropriate?
N
To "Focus Section"
Y
Check the connections between the IC350 93, 94 and IC410 11, 10 and the connection of C and R connected to the above lines.
Y
Y
Is the sound normal after playing the first music?
N
Check the audio circuit
Is the tracking servo functioning?
N
To "Tracking Section"
Y
Y
Are the respective music's searched correctly?
N
To "Feed Section"
Is any eye pattern output to TP RF?
N
Check the connection between the pickup and IC310?
Y
PIT AREA
Check the connections between the IC310 and IC350 RF signals; between the IC350 60 to 63 PAL circuit; and between asymmetry circuits of IC350 55 and 56.
GROOVE AREA
Check the soldering between IC337 and IC338 and connection between the IC310 33 and IC350 82.
Y
Is the recording action normal?
N
Y
OK
Is the recording laser power normal?
N
Change the pickup.
Y
Are the shape and resistance value of the magnetic head normal?
N
Change the magnetic head.
Y
Check the connections between the ELM signal system and those between the IC450 8 and 40.

Outputs of IC450 8 and 40 when the action is normal


Approx. 0.5ms
Approx. 1.5ms

Tracking Section



Is the waveform in Photo. 4 output from the IC310 26 (TE) when set to the spindle rough servo under [TEST MODE 3]?

Check the connections between IC310 6,7 and CN300 13, 16.

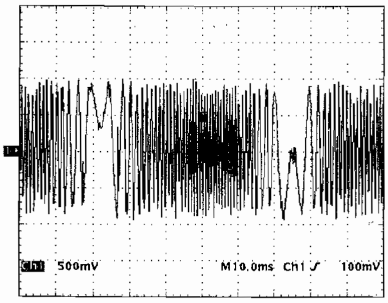
Does the upper waveform swing roughly centering on VC?

Try readjustment by referring to the adjustment method in the attached sheet.

Is the waveform in Photo. 5 output from the IC310 26 (FE) when the tracking servo has been turned on under [TEST MODE 3]?

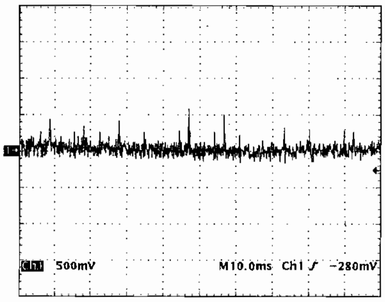
Check the connections between the IC350 85, 86 and IC410 24, 23 and the connection of C and R connected to the above lines.

Photo. 4 (Recordable group)



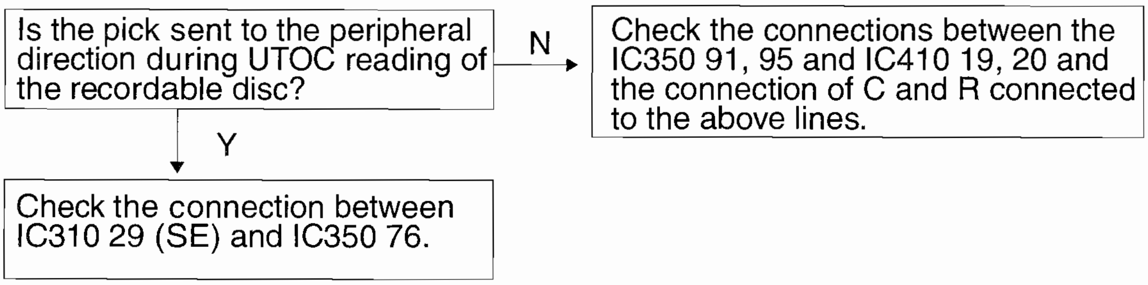
Connect VC to GND of the oscilloscope.

Photo. 5 (Recordable Group)



Connect VC to GND of the oscilloscope.

Feed Section

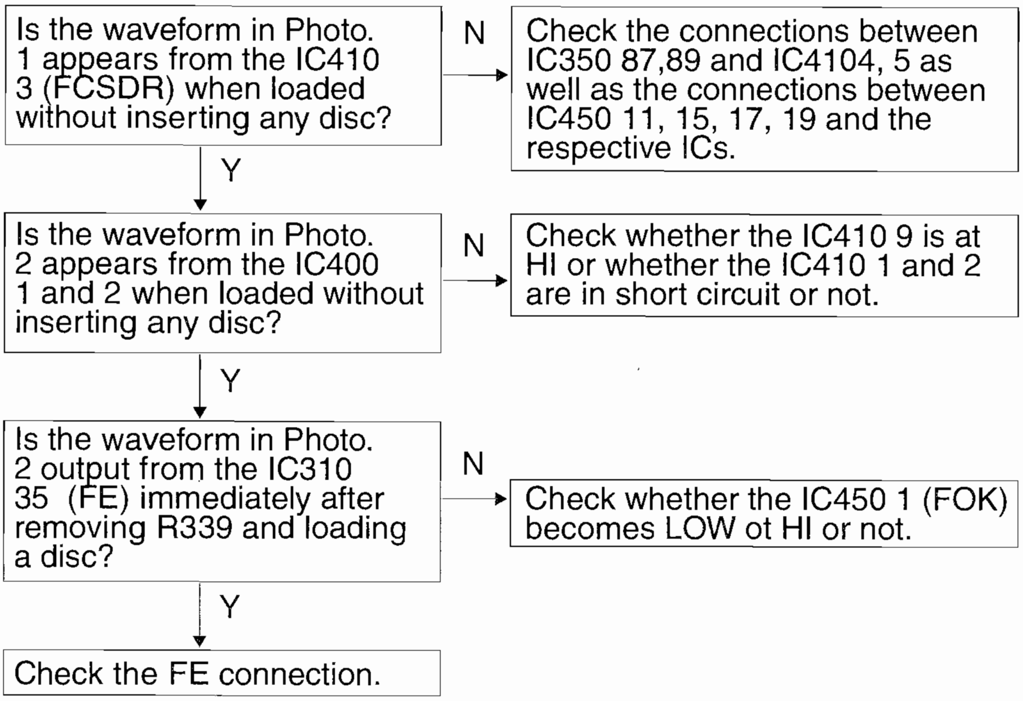


Is the pick sent to the peripheral direction during UTOC reading of the recordable disc?

Check the connections between the IC350 91, 95 and IC410 19, 20 and the connection of C and R connected to the above lines.

Check the connection between IC310 29 (SE) and IC350 76.

Focus Section (prior to executing the following steps, change the source of this set to MD)



Is the waveform in Photo. 1 appears from the IC410 3 (FCSDR) when loaded without inserting any disc?

N → Check the connections between IC350 87,89 and IC4104, 5 as well as the connections between IC450 11, 15, 17, 19 and the respective ICs.

Y ↓

Is the waveform in Photo. 2 appears from the IC400 1 and 2 when loaded without inserting any disc?

N → Check whether the IC410 9 is at HI or whether the IC410 1 and 2 are in short circuit or not.

Y ↓

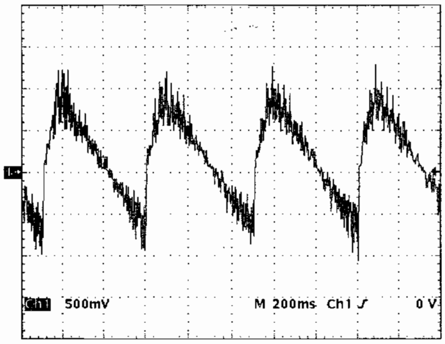
Is the waveform in Photo. 2 output from the IC310 35 (FE) immediately after removing R339 and loading a disc?

N → Check whether the IC450 1 (FOK) becomes LOW ot HI or not.

Y ↓

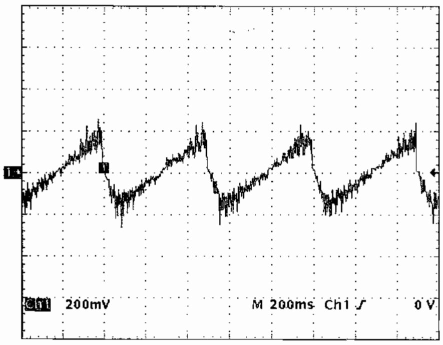
Check the FE connection.

Photo. 1



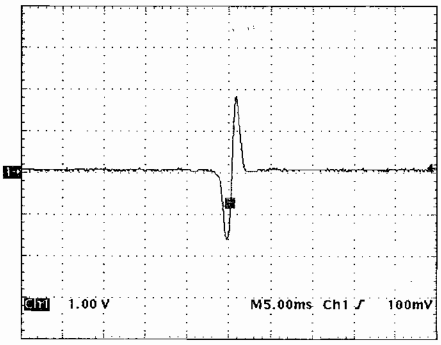
Connect VC to GND of the oscilloscope.

Photo. 2



Voltage between IC401 (a) and (2).

Photo. 3

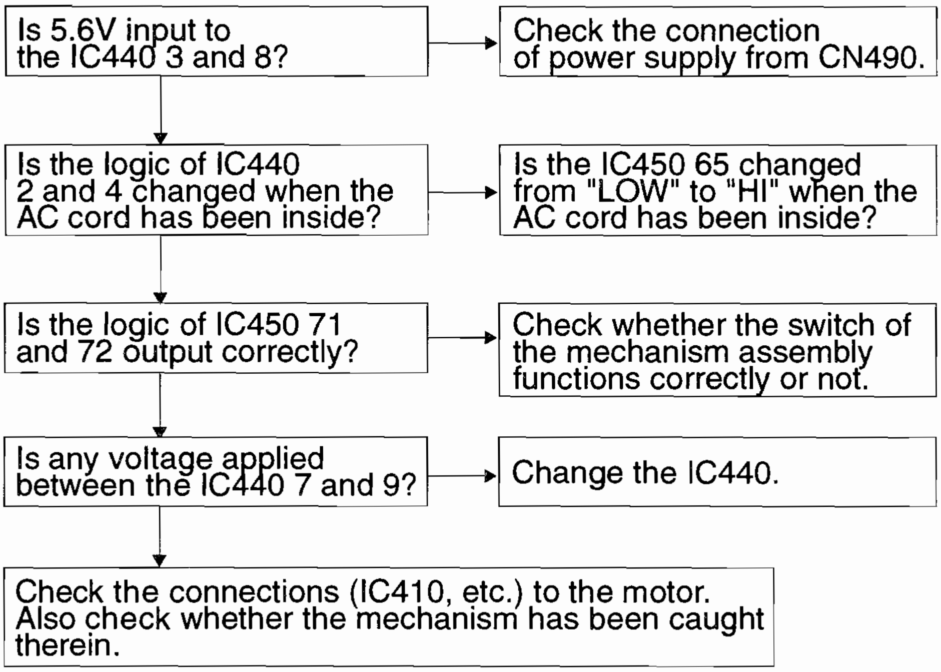


Connect VC to GND of the oscilloscope.

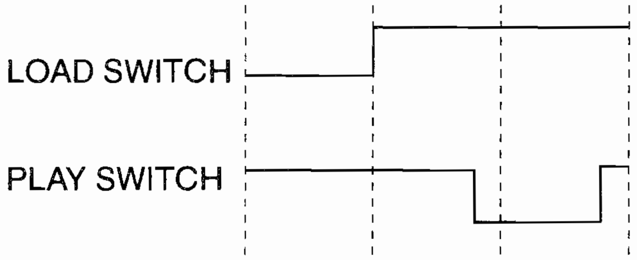
EEPROM SECTION

After resetting, the microcomputer will access to EEPROM and read out all of the address values. In case the address data which have been read out this time do not coincide with those on the microcomputer program, the EEPROM data will all be rewritten and read out once again. Should the address values read out at this time do not coincide with those on the microcomputer program, then a cycle from writing through to reading and comparison will be repeated until the values which have been read out coincide with the written values. Therefore, the program will not proceed any further. When the contents of EEPROM have been damaged or EEPROM has been replaced with a new one, this system will placed into this state. In such a case, turn of the AC power supply, and after connecting IC450 50 to GND, turn on the AC power supply. At this time, the mechanism will perform the [EJECT] action (Otherwise, repeat the adjustment steps). In case the mechanism does not perform any [EJECT] action, an electrical breakdown of EEPROM (IC453) can be considered.

Loading Section


Is 5.6V input to the IC440 3 and 8?
Check the connection of power supply from CN490.
Is the logic of IC440 2 and 4 changed when the AC cord has been inside?
Is the IC450 65 changed from "LOW" to "HI" when the AC cord has been inside?
Is the logic of IC450 71 and 72 output correctly?
Check whether the switch of the mechanism assembly functions correctly or not.
Is any voltage applied between the IC440 7 and 9?
Change the IC440.
Check the connections (IC410, etc.) to the motor. Also check whether the mechanism has been caught therein.

Timing of the mechanism switch


LOAD SWITCH
PLAY SWITCH

Main Adjustments

1.Jig List

(1) Measuring instruments : Oscilloscope, Laser power meter (ADVANTEST TQ8210 or equivalent) and recordable disc Remote controller.

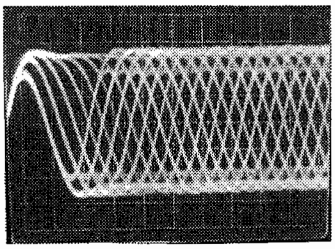
(2) Test Disc : Premastered disc "MRG-1018"

2.Setting of adjustment test mode

Adjust the electrical circuits after turning on the test mode. For setting to test mode, plug in the AC receptacle while pressing the [POWER] key and [INPUT] key. Next, confirm that [C.MODE] is indicated on the FL when the [INPUT] key has been released after releasing the [POWER] key.

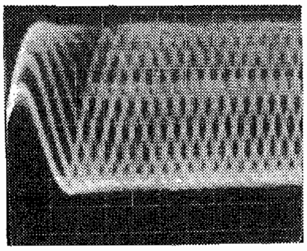
Items	Adjustment method	Adjusting position	Reference value
1. Adjustment of laser power	(1) When the key "2" of the remote controller has been pressed, the laser power will emitted due to the playing power (beam). At this time, measure the laser beam with the laser power meter, and adjust the laser power while pressing the ⏭key (LASER POWER UP) and ⏮ key (LASER POWER DOWN) on the body. (2) Press the ten key "4" of the remote controller. Then, the laser power will emitted due to the recording power. At this time, measure the laser beam with the laser power meter, and adjust the laser power while pressing the ⏭ key (LASER POWER UP) and ⏮ key (LASER POWER DOWN) on the body. (3) After completion of this adjustment, press the [STOP] key of the remote controller at first. Then, press the [EJECT] key of the remote controller. NOTE: Since the laser diode may sometimes be damaged during this adjustment with utmost care.	⏭ key on the body ⏮ key on the body	(1) 0.68mW or more and close to 0.68 (1) 6.23mW or more and close to 6.23
2. Adjustment of disc	(1) After adjustment of the laser power, load a premastered disc and press the [PLAY] key of the remote controller. Then, "OK" will be indicated on the FL about 8 seconds after pressing the above key. At this time, confirm that the waveform of the RF signal is as indicated in the diagram below (left side). After adjusting the laser power, press the [STOP] key at first and the [EJECT] of the remote controller next. (2) Load a recordable disc, and about 15 seconds after pressing the [PLAY] key, "OK" will be indicated on the FL. At this time, confirm that the RF signal waveform is as indicated the diagram below (right side). After completion of measurement, press the [STOP] key at first and the [EJECT] key of the remote controller next. (3) When "NG" is indicated on the FL, this adjustment will be in failure. In such a case, change the disc and perform this adjustment again. NOTE: Be sure to confirm the disc after adjusting the laser power. Moreover, the disc to be used for confirmation should be free from any scratch or other foreign matter, and the recordable disc to be used fully recorded.	Since this adjustment is made automatically, there is no adjusting.	—

RF signal waveform of premastered disc



0.2V/div. 0.5msec/div.

RF signal waveform of recordable disc



0.2V/div. 0.5msec/div.

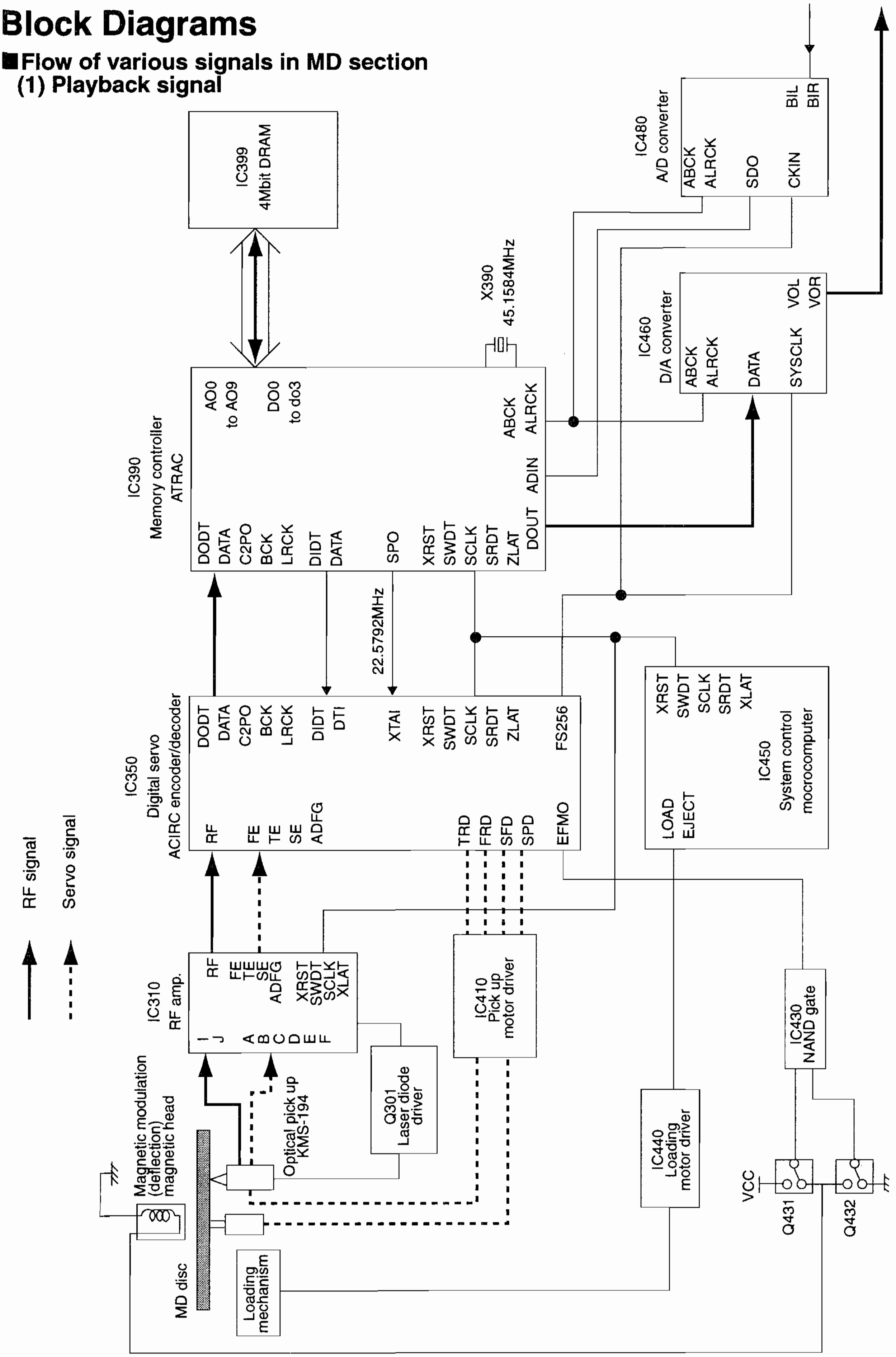
4.Test mode releasing method

After completion of the above confirmation, draw out the AC receptacle and release the test mode (When any key other than specified above has been pressed prior to drawing out the AC receptacle, it may sometimes be impossible to perform correct adjustment).

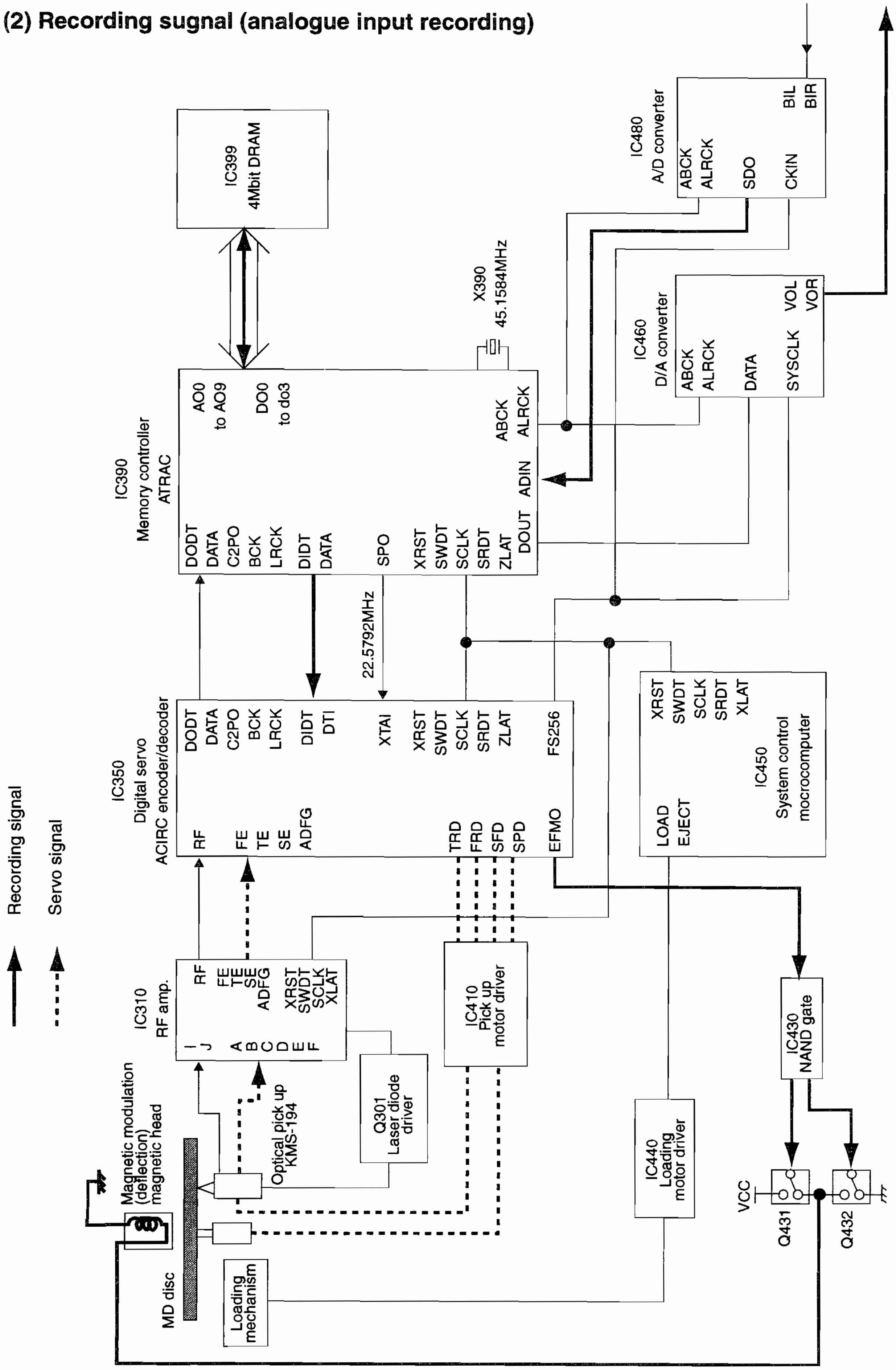
Block Diagrams

■Flow of various signals in MD section

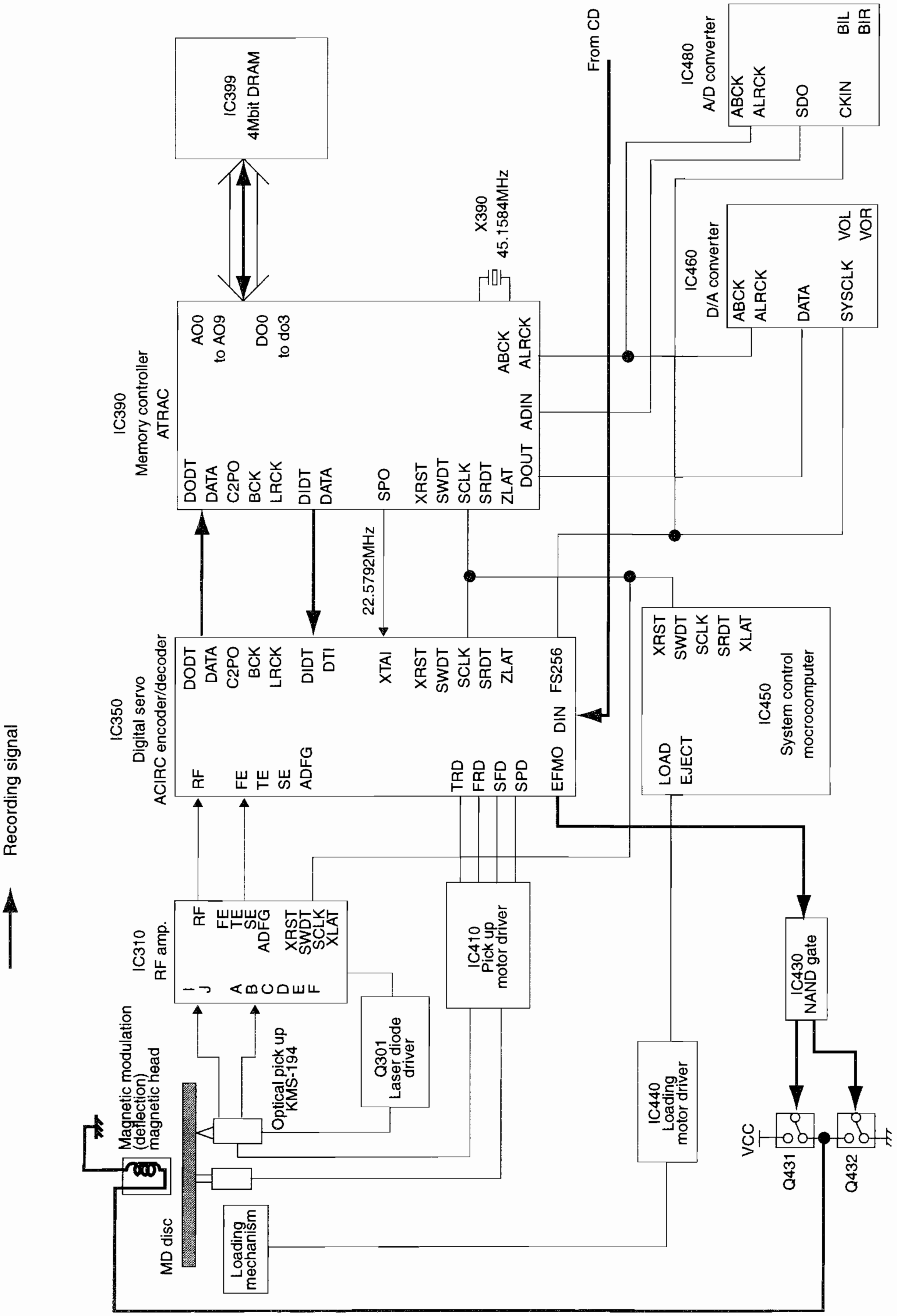
(1) Playback signal


RF signal
Servo signal
IC399
4Mbit DRAM
IC390
Memory controller
ATRAC
AO0
to AO9
DO0
to do3
ABCK
ALRCK
ADIN
DOUT
DODT
DATA
C2PO
BCK
LRCK
DIDT
DATA
SPO
XRST
SWDT
SCLK
SRDT
ZLAT
X390
45.1584MHz
22.5792MHz
IC480
A/D converter
ABCK
ALRCK
SDO
CKIN
BIL
BIR
IC460
D/A converter
ABCK
ALRCK
DATA
SYSCLK
VOL
VOR
IC350
Digital servo
ACIRC encoder/decoder
DODT
DATA
C2PO
BCK
LRCK
DIDT
DTI
XTAI
XRST
SWDT
SCLK
SRDT
ZLAT
FS256
RF
FE
TE
SE
ADFG
TRD
FRD
SFD
SPD
EFMO
IC450
System control
mocrocomputer
XRST
SWDT
SCLK
SRDT
XLAT
LOAD
EJECT
IC310
RF amp.
I
J
A
B
C
D
E
F
RF
FE
TE
SE
ADFG
XRST
SWDT
SCLK
XLAT
IC410
Pick up
motor driver
Q301
Laser diode
driver
Optical pick up
KMS-194
Magnetic modulation
(deflection)
magnetic head
MD disc
Loading
mechanism
IC440
Loading
motor driver
IC430
NAND gate
VCC
Q431
Q432

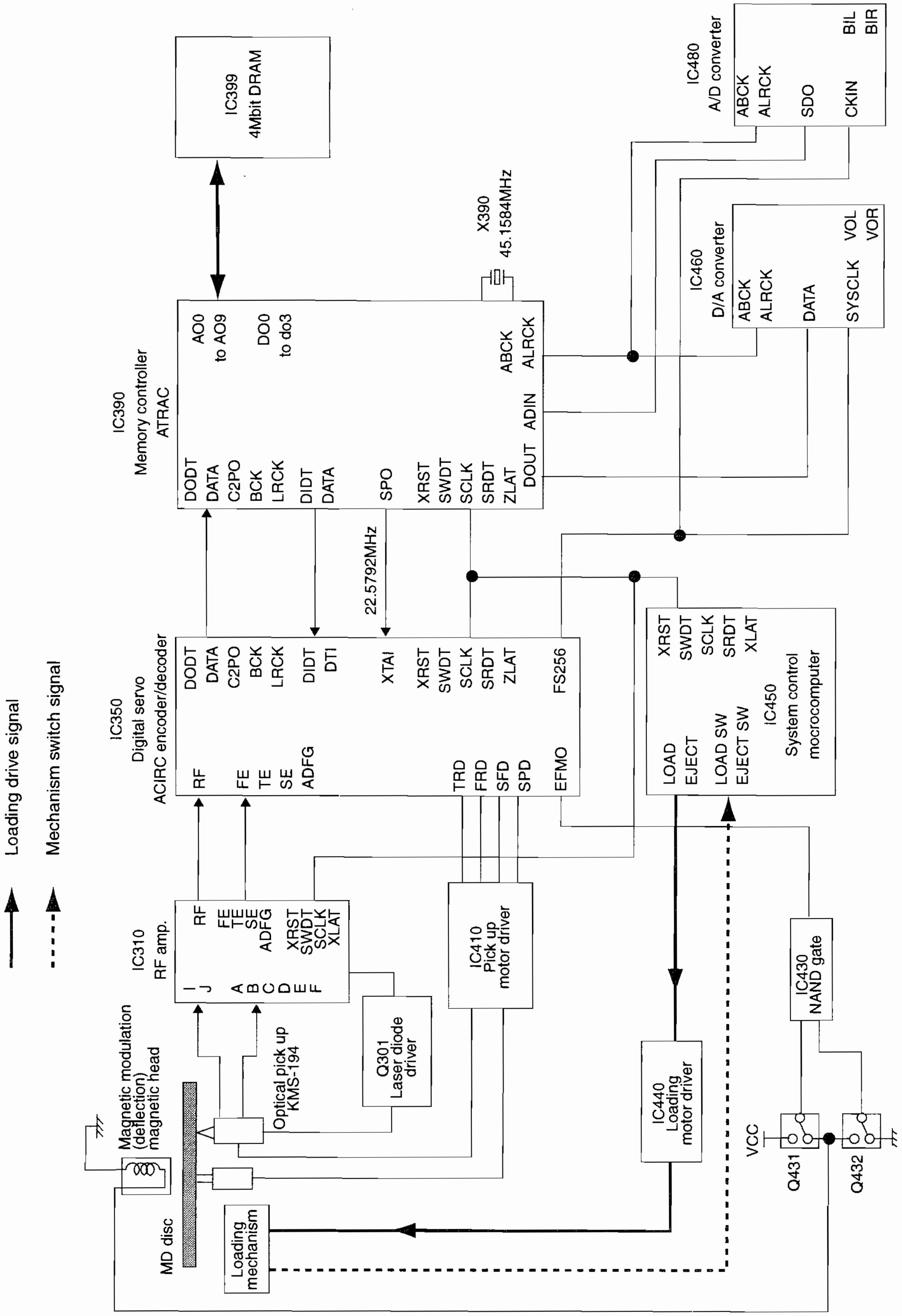
(2) Recording sugnal (analogue input recording)


Recording signal
Servo signal
IC399
4Mbit DRAM
IC480
A/D converter
ABCK
ALRCK
SDO
CKIN
BIL
BIR
X390
45.1584MHz
IC460
D/A converter
ABCK
ALRCK
DATA
SYSCLK
VOL
VOR
IC390
Memory controller
ATRAC
AO0
to AO9
DO0
to do3
ABCK
ALRCK
ADIN
DOUT
DODT
DATA
C2PO
BCK
LRCK
DIDT
DATA
SPO
XRST
SWDT
SCLK
SRDT
ZLAT
22.5792MHz
IC350
Digital servo
ACIRC encoder/decoder
DODT
DATA
C2PO
BCK
LRCK
DIDT
DTI
XTAI
XRST
SWDT
SCLK
SRDT
ZLAT
FS256
RF
FE
TE
SE
ADFG
TRD
FRD
SFD
SPD
EFMO
XRST
SWDT
SCLK
SRDT
XLAT
IC450
System control
mocrocomputer
LOAD
EJECT
IC310
RF amp.
RF
FE
TE
SE
ADFG
XRST
SWDT
SCLK
XLAT
I
J
A
B
C
D
E
F
IC410
Pick up
motor driver
IC430
NAND gate
Q301
Laser diode
driver
Magnetic modulation
(deflection)
magnetic head
Optical pick up
KMS-194
IC440
Loading
motor driver
VCC
Q431
Q432
MD disc
Loading
mechanism

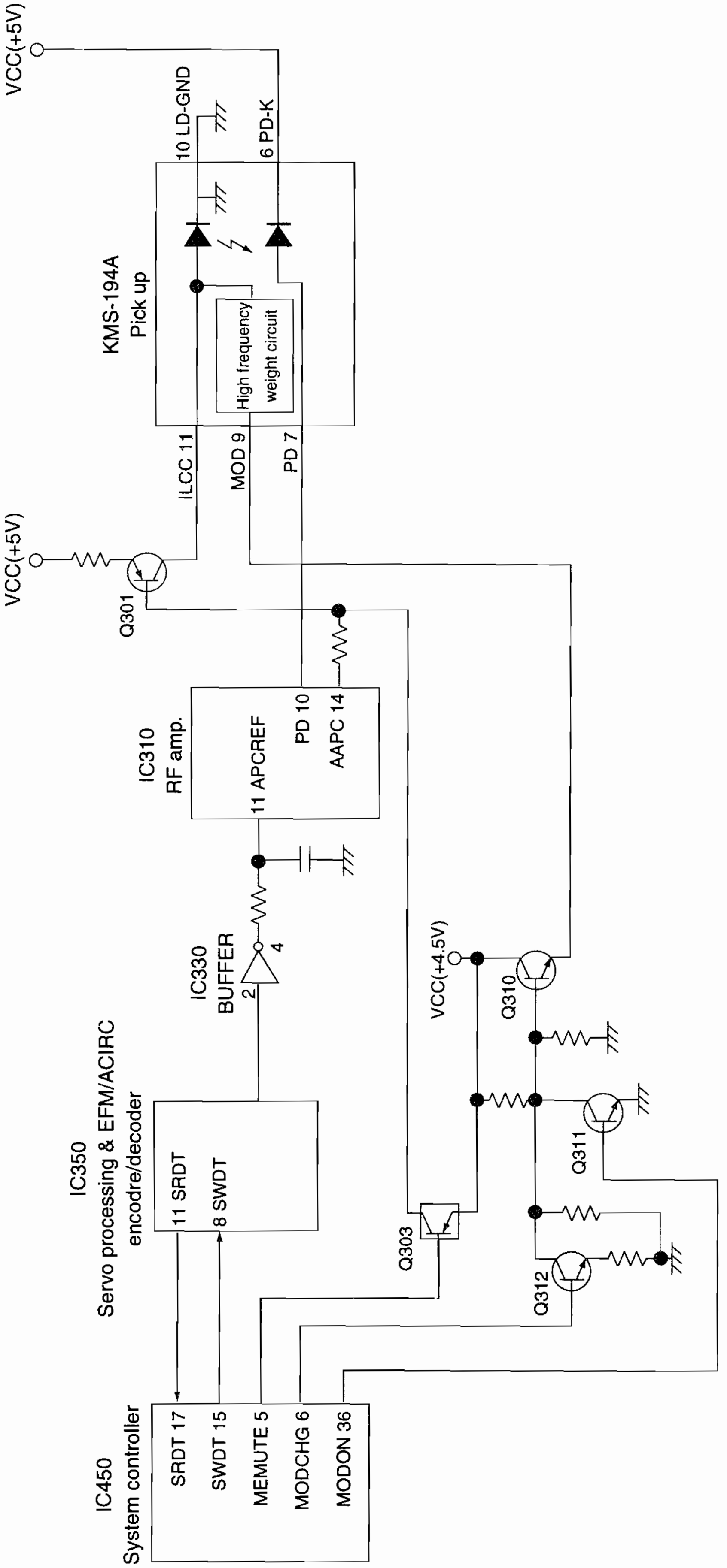
(3) Recording sugnal (digital input recording)


Recording signal
IC399
4Mbit DRAM
From CD
IC480
A/D converter
ABCK
ALRCK
SDO
CKIN
BIL
BIR
X390
45.1584MHz
IC460
D/A converter
ABCK
ALRCK
DATA
SYSCLK
VOL
VOR
IC390
Memory controller
ATRAC
AO0
to AO9
DO0
to do3
ABCK
ALRCK
ADIN
DOUT
DODT
DATA
C2PO
BCK
LRCK
DIDT
DATA
SPO
XRST
SWDT
SCLK
SRDT
ZLAT
22.5792MHz
IC350
Digital servo
ACIRC encoder/decoder
DODT
DATA
C2PO
BCK
LRCK
DIDT
DTI
XTAI
XRST
SWDT
SCLK
SRDT
ZLAT
FS256
RF
FE
TE
SE
ADFG
TRD
FRD
SFD
SPD
EFMO
DIN
XRST
SWDT
SCLK
SRDT
XLAT
IC450
System control
mocrocomputer
LOAD
EJECT
IC310
RF amp.
RF
FE
TE
SE
ADFG
XRST
SWDT
SCLK
XLAT
I
J
A
B
C
D
E
F
IC410
Pick up
motor driver
Q301
Laser diode
driver
Magnetic modulation
(deflection)
magnetic head
Optical pick up
KMS-194
MD disc
Loading
mechanism
IC440
Loading
motor driver
IC430
NAND gate
VCC
Q431
Q432

(4) Disc loading and eject signal


Loading drive signal
Mechanism switch signal
IC399
4Mbit DRAM
IC390
Memory controller
ATRAC
AO0
to AO9
DO0
to do3
DODT
DATA
C2PO
BCK
LRCK
DIDT
DATA
SPO
XRST
SWDT
SCLK
SRDT
ZLAT
DOUT
ADIN
ABCK
ALRCK
X390
45.1584MHz
IC480
A/D converter
ABCK
ALRCK
SDO
CKIN
BIL
BIR
IC460
D/A converter
ABCK
ALRCK
DATA
SYSCLK
VOL
VOR
22.5792MHz
IC350
Digital servo
ACIRC encoder/decoder
DODT
DATA
C2PO
BCK
LRCK
DIDT
DTI
XTAI
XRST
SWDT
SCLK
SRDT
ZLAT
FS256
RF
FE
TE
SE
ADFG
TRD
FRD
SFD
SPD
EFMO
XRST
SWDT
SCLK
SRDT
XLAT
IC450
System control
mocrocomputer
LOAD
EJECT
LOAD SW
EJECT SW
IC310
RF amp.
RF
FE
TE
SE
ADFG
XRST
SWDT
SCLK
XLAT
I
J
A
B
C
D
E
F
IC410
Pick up
motor driver
Q301
Laser diode
driver
Magnetic modulation
(deflection)
magnetic head
Optical pick up
KMS-194
MD disc
Loading
mechanism
IC440
Loading
motor driver
IC430
NAND gate
VCC
Q431
Q432

(5) Pick up laser power control signal

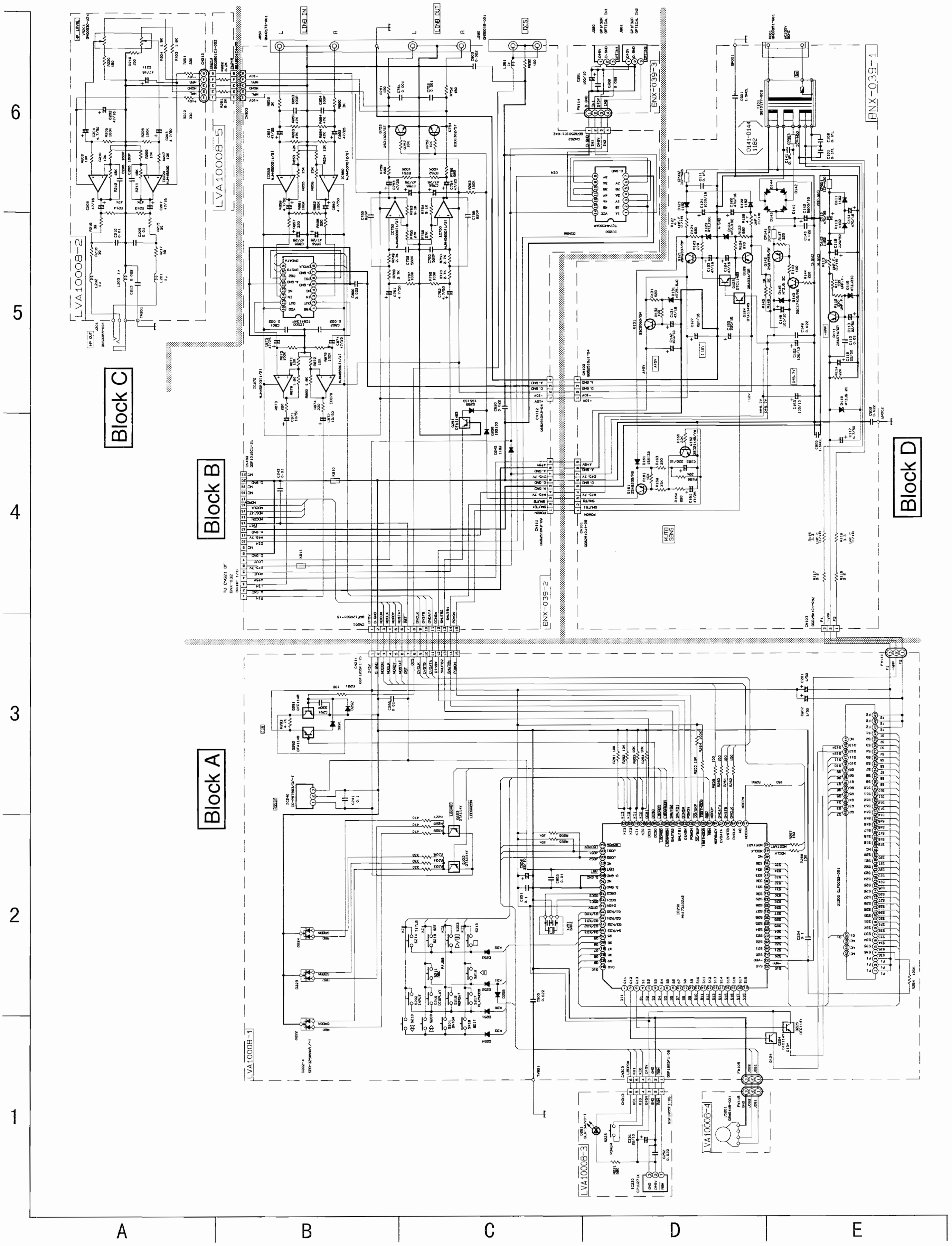

VCC(+5V)
10 LD-GND
6 PD-K
KMS-194A
Pick up
High frequency
weight circuit
ILCC 11
MOD 9
PD 7
VCC(+5V)
Q301
IC310
RF amp.
11 APCREF
PD 10
AAPC 14
IC330
BUFFER
2
4
VCC(+4.5V)
Q310
Q311
Q303
Q312
IC350
Servo processing & EFM/ACIRC
encodre/decoder
11 SRDT
8 SWDT
IC450
System controller
SRDT 17
SWDT 15
MEMUTE 5
MODCHG 6
MODON 36

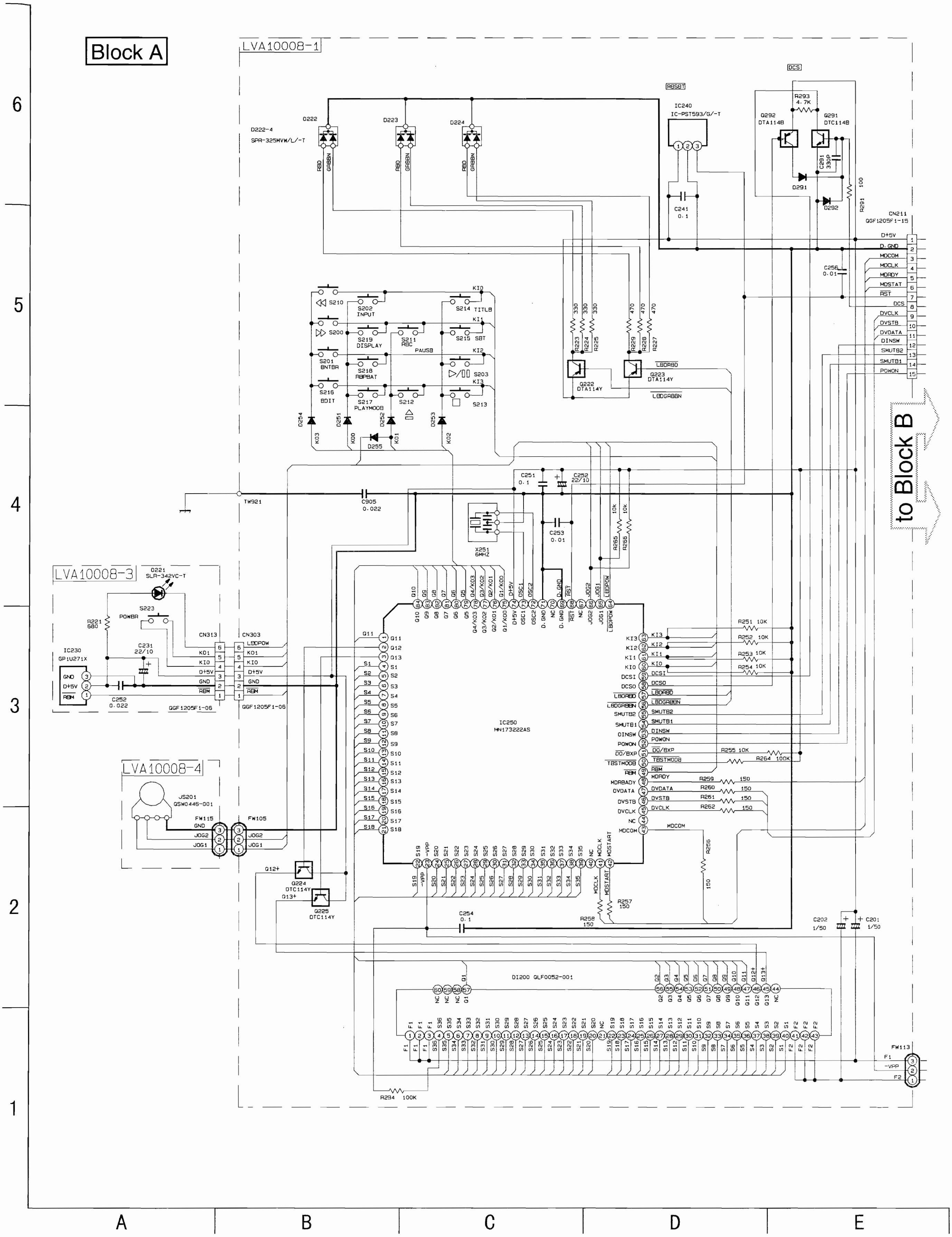
(1) Adjust the laser power to 0.68mW with the REC.START and TRACK MARKING keys. - Playback laser power
(2) Adjust the laser power to 6.23mW with the REC.START and TRACK MARKING keys. -Recording laser power

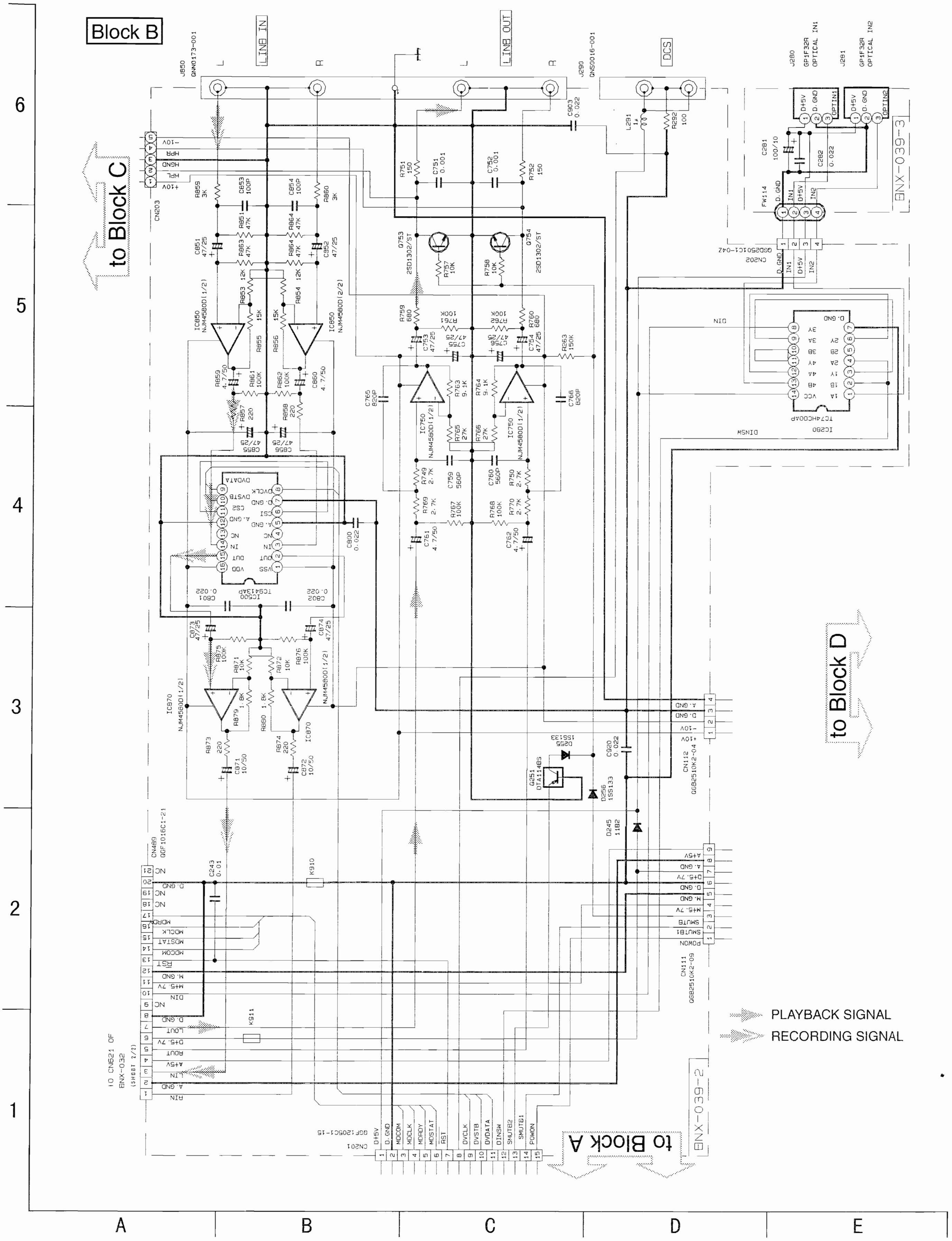
<<MEMO>>

Standard Schematic Diagrams

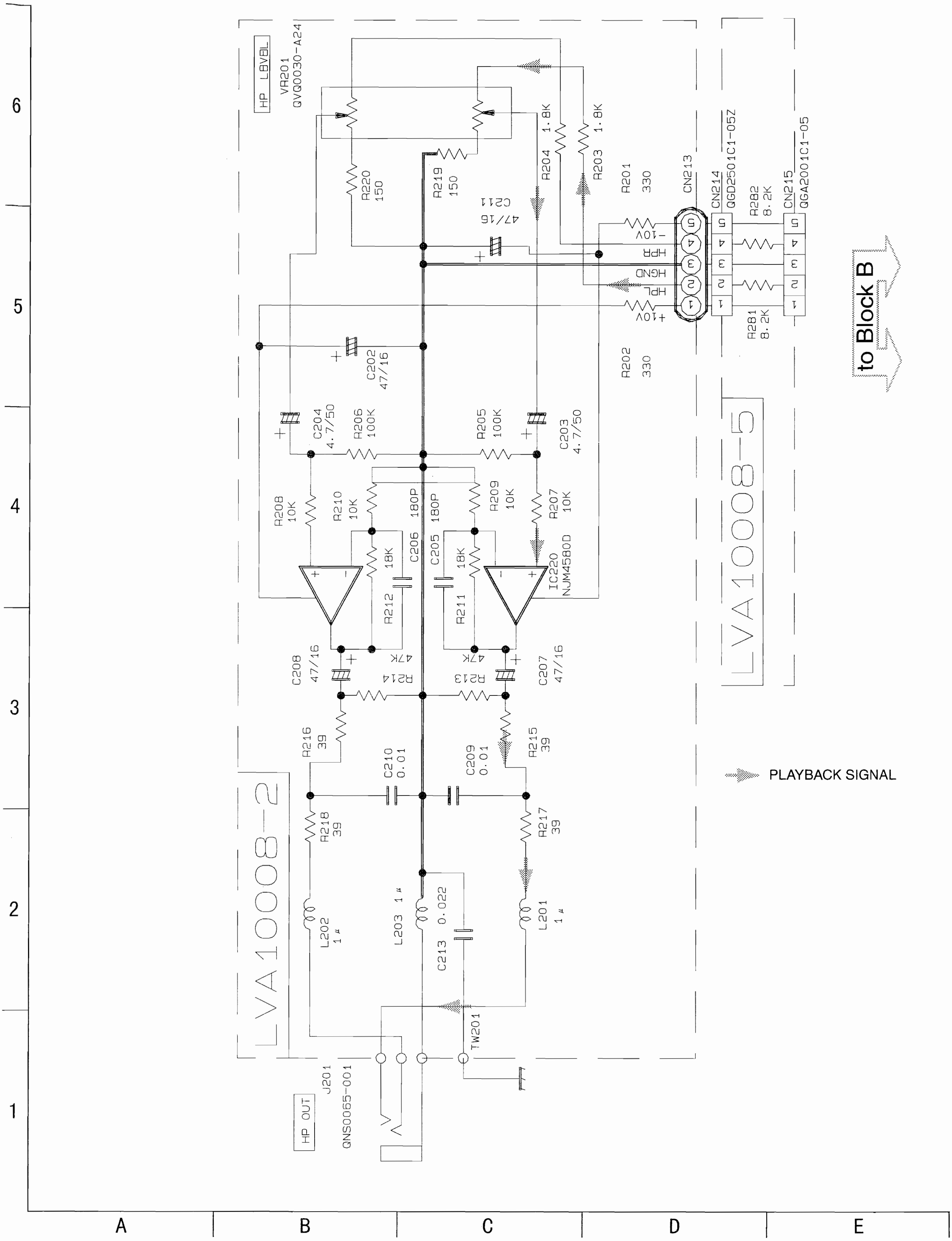
■Main section


LINE IN
LINE OUT
OCS
LVA10008-2
LVA10008-5
BNX-039-3
BNX-039-1
BNX-039-2
LVA10008-1
LVA10008-3
LVA10008-4
Block C
Block B
Block A
Block D
6
5
4
3
2
1
A
B
C
D
E

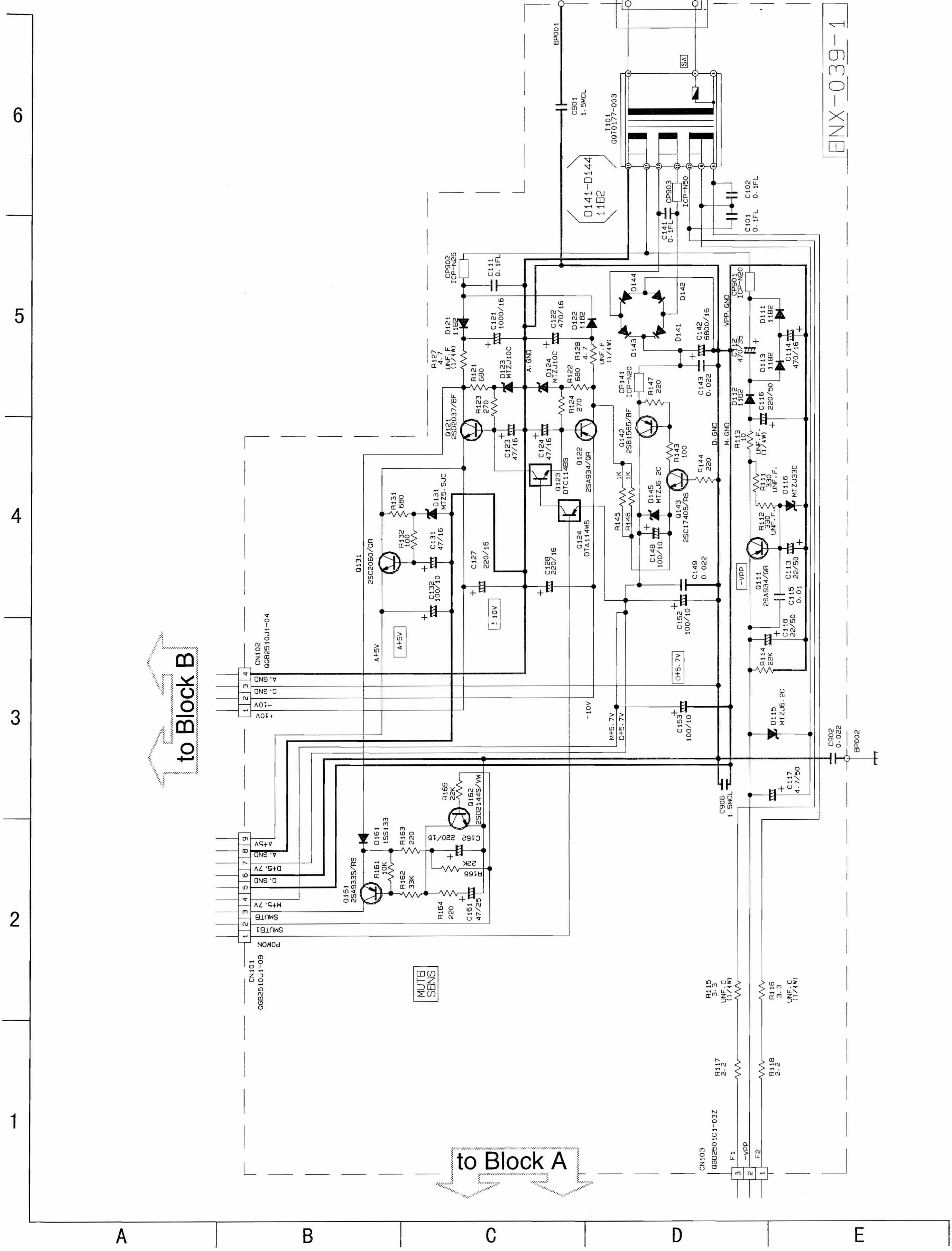

Block A
LVA10008-1
LVA10008-3
LVA10008-4
to Block B
D222-4 SPR-325MVW/L/-T
D222
D223
D224
RBD
GRBBN
IC240 IC-PST593/G/-T
RBSBT
DCS
R293 4.7K
Q292 DTA114B
Q291 DTC114B
C291 330P
D291
D292
R291 100
C241 0.1
CN211 QGF1205F1-15
D+5V
D.GND
MDCOM
MDCLK
MDRDY
MDSTAT
RST
DCS
DVCLK
DVSTB
DVDATA
DINSW
SMUTB2
SMUTB1
POWON
C256 0.01
S210
S202 INPUT
S214 TITLB
S200
S219 DISPLAY
S211 RBC
PAUSB
S215 SBT
S201 BNTBR
S218 RBPBAT
S203
S216 BDIT
S217 PLAYMODB
S212
S213
KI0
KI1
KI2
KI3
KO0
KO1
KO2
KO3
D254
D251
D252
D253
D255
R223 330
R224 330
R225 330
R229 470
R228 470
R227 470
Q222 DTA114Y
Q223 DTA114Y
LBDRBD
LBDGRBBN
TW921
C905 0.022
C251 0.1
C252 22/10
C253 0.01
X251 6MHZ
R265 10k
R266 10k
D221 SLR-342VC-T
S223 POWBR
R221 680
IC230 GP1U271X
GND
D+5V
RBM
C231 22/10
C252 0.022
CN313
CN303
LBDPOW
QGF1205F1-06
JS201 QSW0446-001
FW115
FW105
JOG2
JOG1
IC250 MN173222AS
R251 10K
R252 10K
R253 10K
R254 10K
DCSI
DCSO
TBSTMODB
DO/BXP
R255 10K
R264 100K
R259 150
R260 150
R261 150
R262 150
R256 150
R257 150
R258 150
MDSTART
NC
Q224 DTC114Y
Q225 DTC114Y
Q12+
Q13+
C254 0.1
C202 1/50
C201 1/50
DI200 QLF0052-001
F1
F2
-VPP
FW113
R294 100K
1
2
3
4
5
6
A
B
C
D
E


Block B
to Block C
to Block D
to Block A
LINE IN
LINE OUT
DCS
J850 QNN0173-001
J290 QNS0016-001
J280 GP1F32R OPTICAL IN1
J281 GP1F32R OPTICAL IN2
IC850 NJM4580D(1/2)
IC850 NJM4580D(2/2)
IC750 NJM4580D(1/2)
IC870 NJM4580D(1/2)
IC500 TC9413AP
IC280 TC74HC00AP
Q753 2SD1302/ST
Q754 2SD1302/ST
Q251 DTA114ES
D253 1SS133
D256 1SS133
D245 11B2
CN203
CN202 QGB2501C1-04Z
CN201 QGF1205C1-15
CN112 QGB2510K2-04
CN111 QGB2510K2-09
CN489 QGF1016C1-21
TO CN621 OF ENX-032 (SHEET 2/2)
FW114
ENX-039-3
ENX-039-2
PLAYBACK SIGNAL
RECORDING SIGNAL
A
B
C
D
E
1
2
3
4
5
6

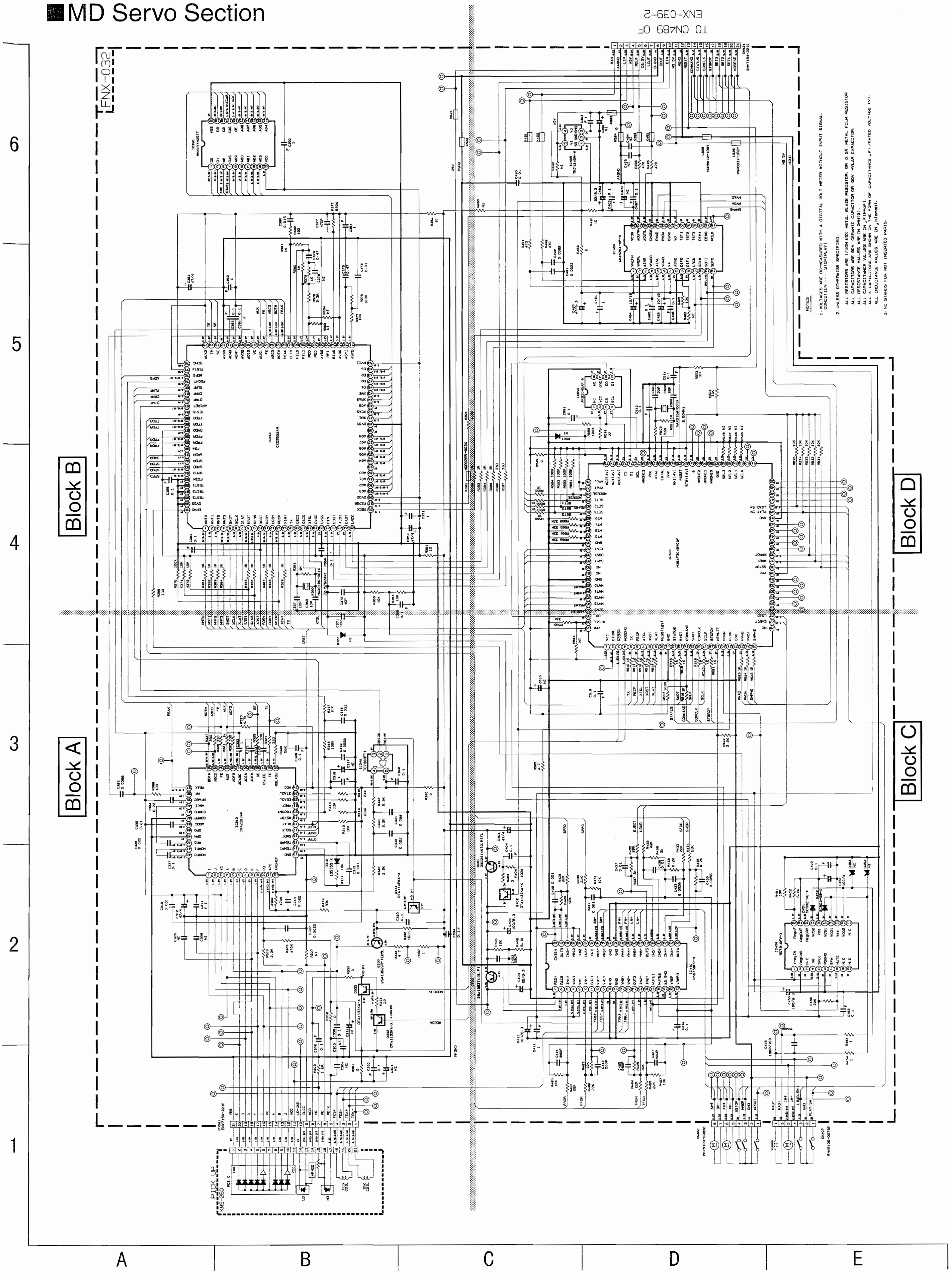
■ Main section Block C


HP LEVEL
VR201
QVQ0030-A24
R220
150
R219
150
R204 1.8K
R203 1.8K
R201
330
R202
330
C211
47/16
C202
47/16
C204
4.7/50
C203
4.7/50
R206
100K
R205
100K
R208
10K
R210
10K
R209
10K
R207
10K
C206 180P
C205 180P
R212
R211
18K
18K
IC220
NJM4580D
C208
47/16
C207
47/16
R214
47K
R213
47K
R216
39
R215
39
C210
0.01
C209
0.01
R218
39
R217
39
L202
1μ
L203 1μ
L201
1μ
C213 0.022
TW201
J201
QNS0065-001
HP OUT
CN213
CN214
QGD2501C1-05Z
CN215
QGA2001C1-05
R282
8.2K
R281
8.2K
-10V
HPR
HGND
HPL
+10V
1
2
3
4
5
LVA10008-2
LVA10008-5
to Block B
PLAYBACK SIGNAL
A
B
C
D
E
1
2
3
4
5
6

■Main section Block D


6
5
4
3
2
1
A
B
C
D
E
to Block B
to Block A
ENX-039-1
BP001
BP002
C901 1.5MCL
C902 0.022
C906 1.5MCL
P001 QNC0051-001
AC230V 50HZ
SA
T101 QQT0177-003
D141–D144 11E2
D141
D142
D143
D144
CP903 ICP-N50
C141 0.1FL
C101 0.1FL
C102 0.1FL
C142 6800/16
C143 0.022
CP902 ICP-N25
C111 0.1FL
D121 11E2
C121 1000/16
C122 470/16
D122 11E2
R127 4.7 UNF.F (1/4W)
R128 4.7 UNF.F (1/4W)
R121 680
D123 MTZJ10C
A.GND
D124 MTZJ10C
R122 680
R123 270
R124 270
Q121 2SD2037/EF
C123 47/16
C124 47/16
Q122 2SA934/QR
Q123 DTC114ES
Q124 DTA114WS
CP141 ICP-N20
R147 220
Q142 2SB1565/EF
R143 100
R144 220
Q143 2SC1740S/RS
D145 MTZJ6.2C
R145 1K
R146 1K
C148 100/10
C149 0.022
C152 100/10
C153 100/10
D.GND
M.GND
VPP.GND
CP901 ICP-N20
C112 470/35
D111 11E2
D113 11E2
D112 11E2
C114 470/16
C116 220/50
R113 10 UNF.F (1/4W)
R111 330 UNF.F
D116 MTZJ33C
R112 330 UNF.F
Q111 2SA934/QR
-VPP
C113 22/50
C115 0.01
C118 22/50
R114 22K
D115 MTZJ6.2C
C117 4.7/50
R131 680
D131 MTZ5.6JC
R132 100
C131 47/16
Q131 2SC2060/QR
C132 100/10
C127 220/16
C128 220/16
±10V
A+5V
D+5.7V
-10V
M+5.7V
D+5.7V
CN102 QGB2510J1-04
4 A.GND
3 D.GND
2 -10V
1 +10V
CN101 QGB2510J1-09
9 A+5V
8 A.GND
7 D+5.7V
6 D.GND
5
4 M+5.7V
3 SMUTB
2 SMUTB1
1 POWON
D161 1SS133
R163 220
R165 22K
Q162 2SD2144S/VW
C162 220/16
R166 22K
Q161 2SA933S/RS
R161 10K
R162 33K
R164 220
C161 47/25
MUTB SENS
R115 3.3 UNF.C (1/4W)
R116 3.3 UNF.C (1/4W)
R117 2.2
R118 2.2
CN103 QGD2501C1-03Z
3 F1
2 -VPP
1 F2

MD Servo Section


ENX-032
TO CN489 OF
ENX-039-2
Block A
Block B
Block C
Block D
PICK UP
KMS-260
IC310
IC330
IC340
IC380
IC400
IC420
IC450
IC460
IC480
M5.5V
MGND
6
5
4
3
2
1
A
B
C
D
E

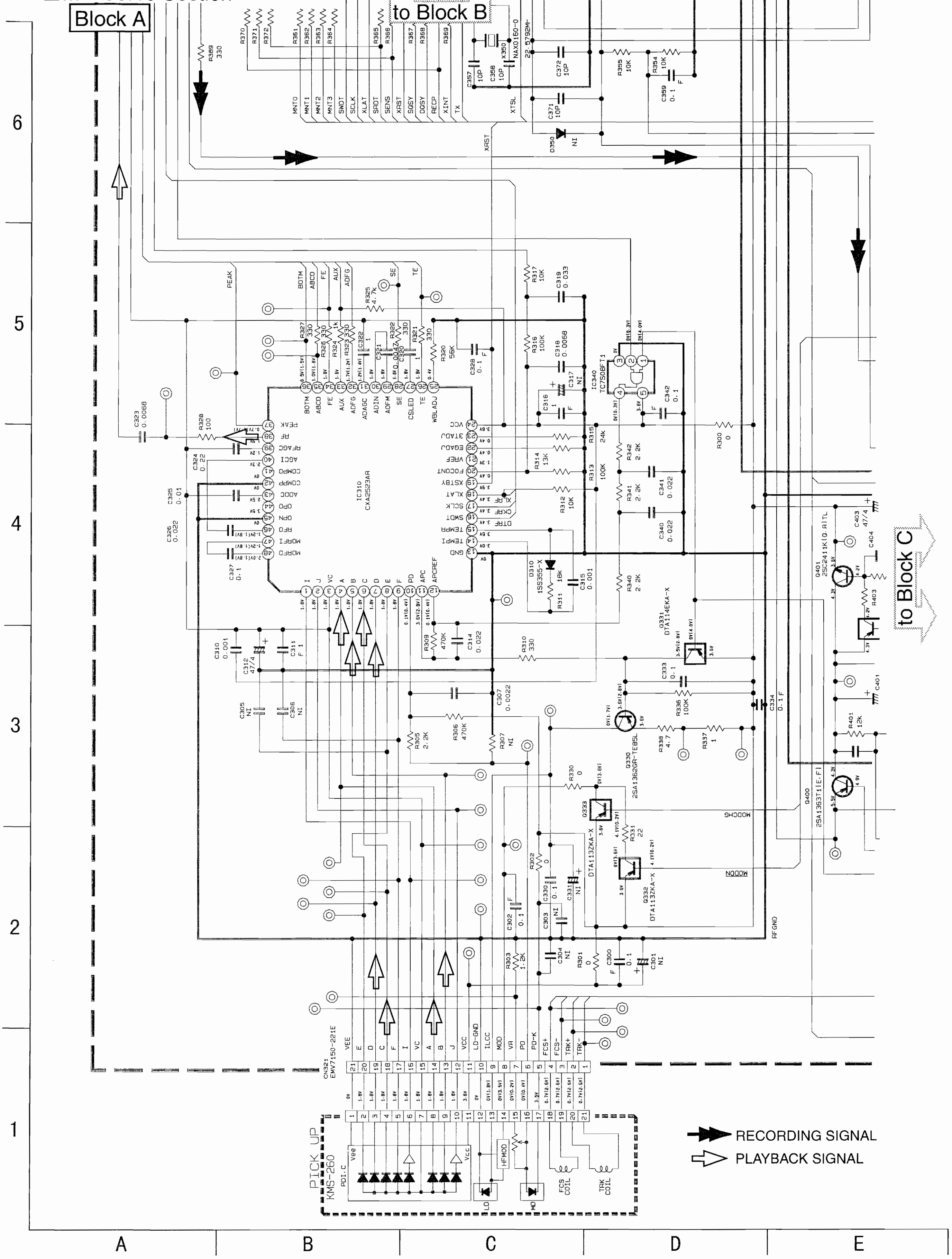
NOTES

1. VOLTAGES ARE DC-MEASURED WITH A DIGITAL VOLT METER WITHOUT INPUT SIGNAL.
CONDITION --- STOP(PLAY)

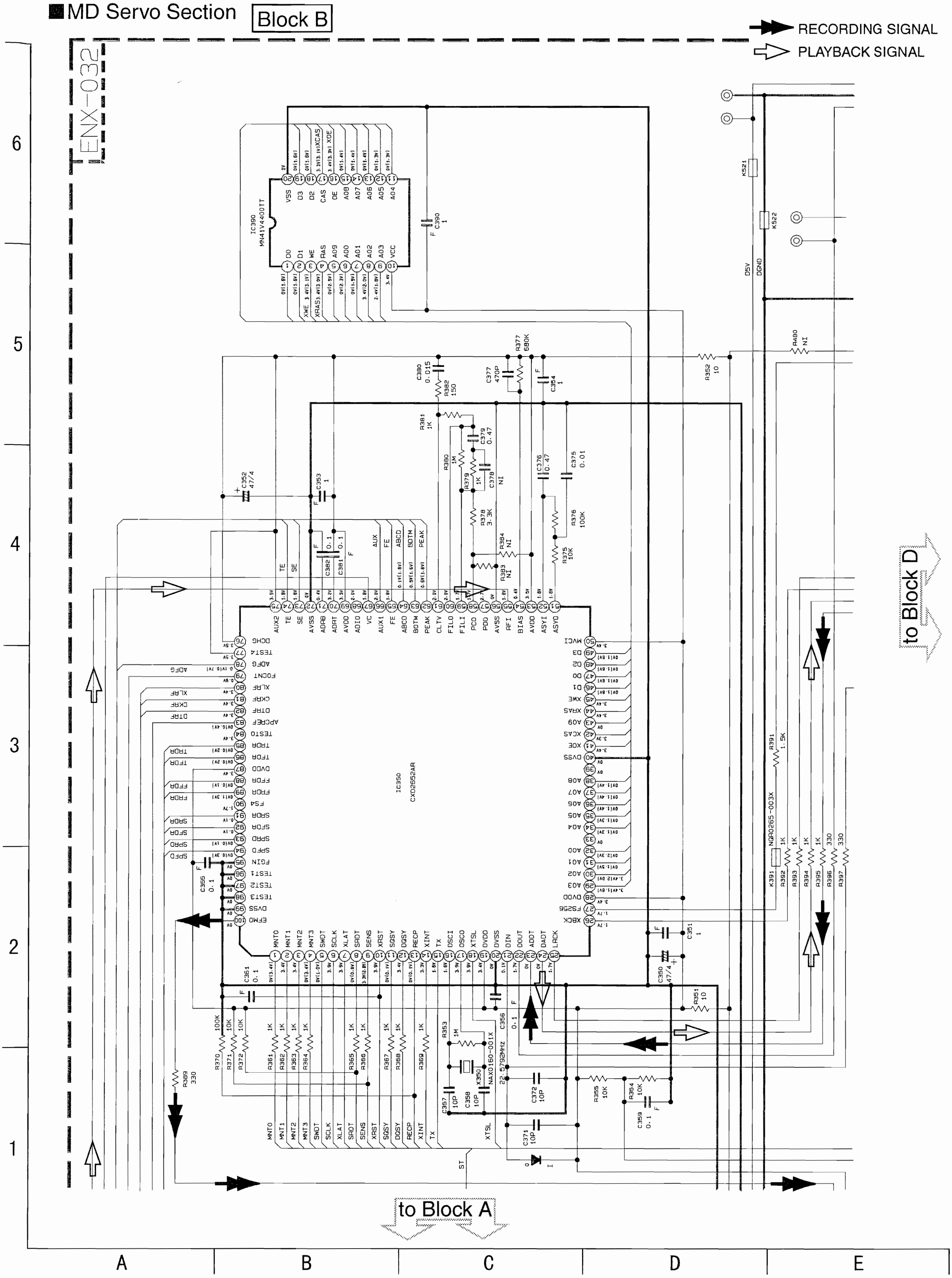
2. UNLESS OTHERWISE SPECIFIED.
ALL RESISTORS ARE 1/10W ±5% METAL GLAZE RESISTOR. OR 0.5% METAL FILM RESISTOR
ALL CAPACITORS ARE 50V CERAMIC CAPACITOR OR 50V MYLAR CAPACITOR.
ALL RESISTANCE VALUES ARE IN OHM(Ω).
ALL CAPACITANCE VALUES ARE IN μF(P=pF).
ALL E.CAPACITORS ARE SHOWN IN THE FORM OF CAPACITANCE(μF)/RATED VOLTAGE (V).
ALL INDUCTANCE VALUES ARE IN μH(m=mH).

3. NI STANDS FOR NOT INSERTED PARTS.

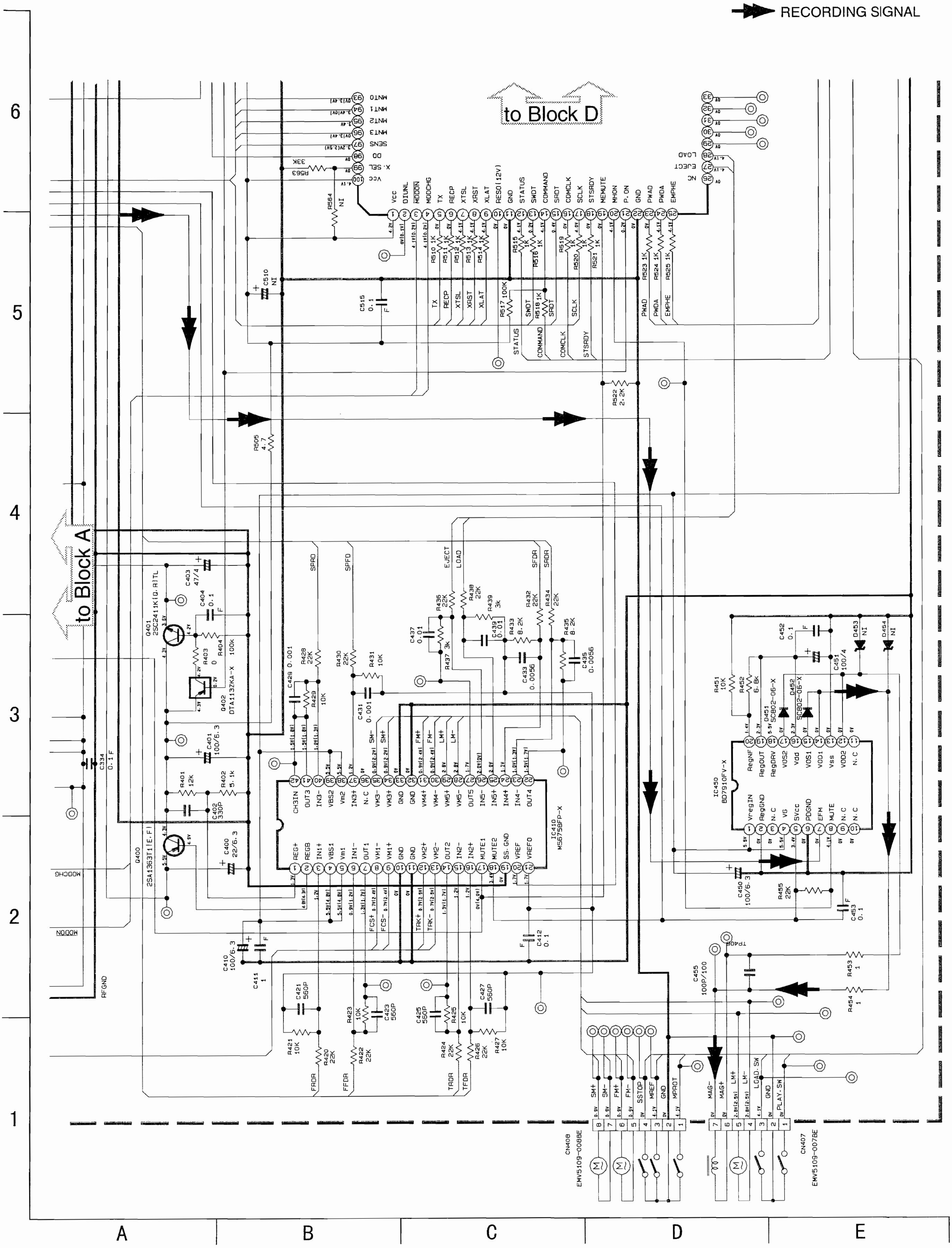
MD Servo Section

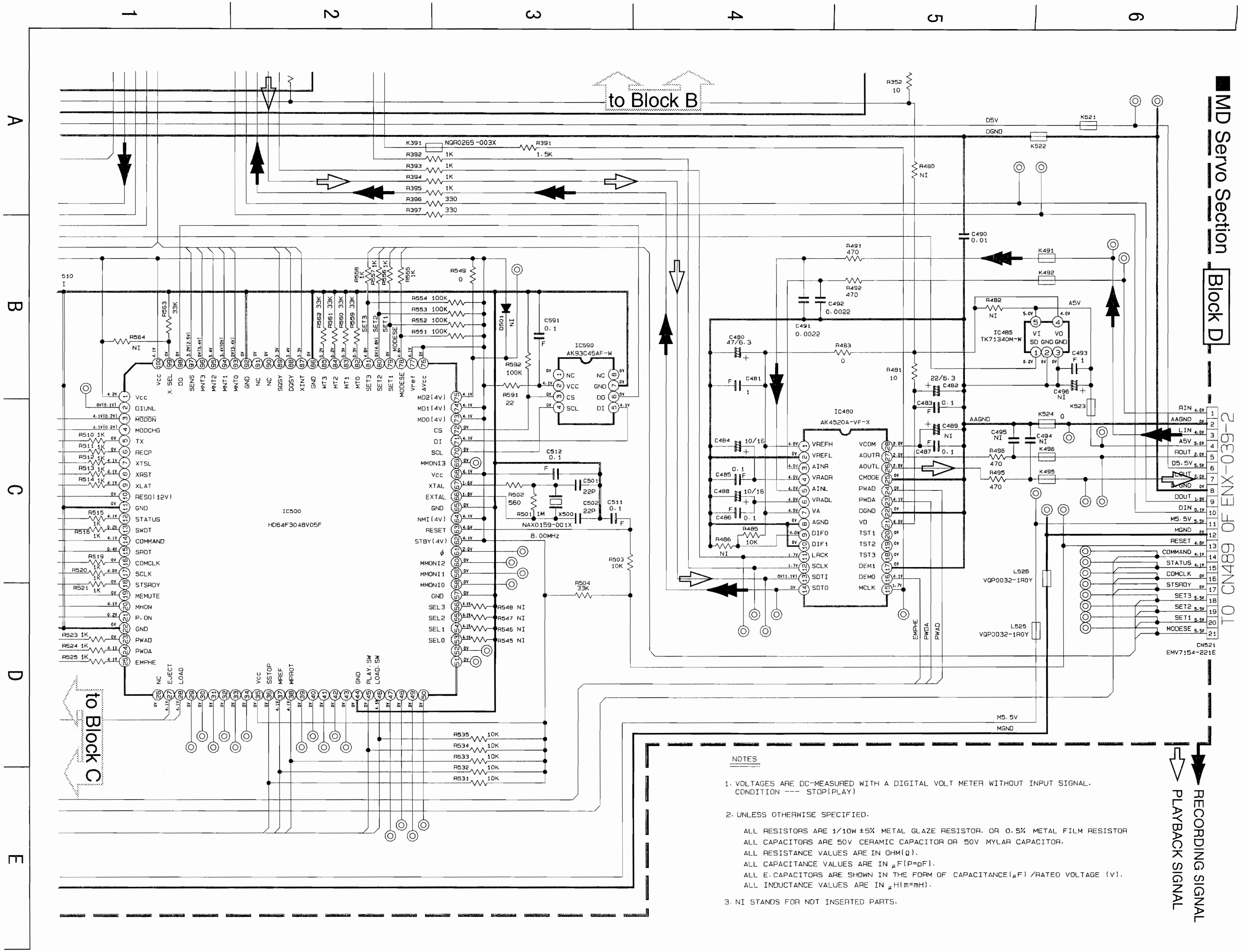

Block A
to Block B
to Block C
IC310 CXA2523AR
IC340 TC7508FT1
CN321 EMV7150-221E
PICK UP KMS-260
PDI.C
HFMOD
LD
MD
FCS COIL
TRK COIL
Q330 2SA1362GR-TE85L
Q331 DTA114EKA-X
Q332 DTA113ZKA-X
Q333 DTA113ZKA-X
Q400 2SA1363T1E,F1
Q401 2SC2411K(Q,R)TL
D310 1SS355-X
D350 NI
X350 NAX0160-0 22.5792MHz
MNTO
MNT1
MNT2
MNT3
SWDT
SCLK
XLAT
SPOT
SENS
XRST
SQSY
DQSY
RECP
XINT
TX
XTSL
PEAK
BOTM
ABCD
FE
AUX
ADFG
SE
TE
MODCHG
MODON
RFGND
VEE
E
D
C
F
I
VC
A
B
J
VCC
LD-GND
ILCC
MOD
VR
PD
PD-K
FCS+
FCS-
TRK+
TRK-
RECORDING SIGNAL
PLAYBACK SIGNAL
1
2
3
4
5
6
A
B
C
D
E

■MD Servo Section Block B


RECORDING SIGNAL
PLAYBACK SIGNAL
ENX-032
IC390
MN41V4400TT
IC350
CXD2652AR
to Block D
to Block A
K521
K522
D5V
DGND
R490 NI
R352 10
R377 680K
C377 470P
C354 1
C380 0.015
R382 150
R381 1K
C379 0.47
R380 1M
R379 1K
C378 NI
R378 3.3K
C376 0.47
C375 0.01
R376 100K
R375 10K
R384 NI
R383 NI
C352 47/4
C353 1
C382 0.1
C381 0.1
C390 1
C355 0.1
C361 0.1
R370 100K
R371 10K
R372 10K
R361 1K
R362 1K
R363 1K
R364 1K
R365 1K
R366 1K
R367 1K
R368 1K
R369 1K
R353 1M
X350 NAX0160-001X 22.5792MHz
C356 0.1
C357 10P
C358 10P
C372 10P
C371 10P
R355 10K
R354 10K
C359 0.1
C350 47/4
C351 1
R351 10
R389 330
R391 1.5K
K391 NQR0265-003X
R392 1K
R393 1K
R394 1K
R395 1K
R396 330
R397 330
MNT0
MNT1
MNT2
MNT3
SWDT
SCLK
XLAT
SRDT
SENS
XRST
SQSY
DQSY
RECP
XINT
TX
XTSL
ST
ADFG
XLRF
CKRF
DTRF
TRDR
TFDR
FFDR
FRDR
SRDR
SFDR
SPRD
SPFD
AUX
FE
ABCD
BOTM
PEAK
TE
SE
A
B
C
D
E
1
2
3
4
5
6

■MD Servo Section Block C


RECORDING SIGNAL
to Block D
to Block A
6
5
4
3
2
1
A
B
C
D
E
IC410 M56758FP-X
IC450 BD7910FV-X
Q400 2SA1363T1(E,F)
Q401 2SC2411K(Q,R)TL
Q402 DTA1137KA-X
D451 SC802-06-X
D452 SC802-06-X
D453 NI
D454 NI
CN408 EMV5109-008BE
CN407 EMV5109-007BE
REG+
REGB
IN1+
VBS1
Vm1
IN1-
OUT1
VM1-
VM1+
GND
VM2+
VM2-
OUT2
IN2-
IN2+
MUTE1
MUTE2
SS.GND
VREF
VREFO
CH3IN
OUT3
IN3-
VBS2
Vm2
IN3+
N.C
VM3-
VM3+
VM4+
VM4-
VM5+
VM5-
OUT5
IN5-
IN5+
IN4+
IN4-
OUT4
VregIN
RegGND
VG
Svcc
PDGND
EFM
MUTE
RegNF
RegOUT
RegDRV
VOS2
Vdd
VOS1
VDD1
Vss
VDD2
Vcc
DIUNL
MODON
MODCHG
TX
RECP
XTSL
XRST
XLAT
RESO(12V)
STATUS
SWDT
COMMAND
SRDT
COMCLK
SCLK
STSRDY
MEMUTE
MHON
P.ON
PWAD
PWDA
EMPHE
NC
EJECT
LOAD
VCC
X.SEL
DD
SENS
MNT3
MNT2
MNT1
MNT0
SM+
SM-
FM+
FM-
SSTOP
MREF
MPROT
MAG-
MAG+
LM+
LM-
LOAD.SW
PLAY.SW
FCS+
FCS-
TRK+
TRK-
SPRD
SPFD
SFDR
SRDR
FRDR
FFDR
TRDR
TFDR
RFGND
TP408
R563 33K
R564 NI
C510 NI
C515 0.1 F
R517 100K
R518 1K
R522 2.2K
R505 4.7
C403 47/4
C404 0.1 F
R404 100K
R403 0
C401 100/6.3
R401 12K
R402 5.1K
C402 330P
C400 22/6.3
C334 0.1F
C410 100/6.3
C411 1
C429 0.001
R428 22K
R429 10K
R430 22K
R431 10K
C431 0.001
C437 0.01
R436 22K
R437 3K
R438 22K
R439 3K
C439 0.01
R433 8.2K
C433 0.0056
R432 22K
R434 22K
R435 8.2K
C435 0.0056
C412 0.1 F
C421 560P
R421 10K
R420 22K
R423 10K
C423 560P
R422 22K
C425 560P
R425 10K
R424 22K
C427 560P
R426 22K
R427 10K
R451 10K
R452 6.8K
C452 0.1 F
C451 100/4
C450 100/6.3
R455 22K
C453 0.1 F
C455 100P/100
R453 1
R454 1


MD Servo Section
Block D
TO CN489 OF ENX-039-2
RECORDING SIGNAL
PLAYBACK SIGNAL
to Block B
to Block C
IC480
AK4520A-VF-X
IC485
TK71340M-W
IC500
HD64F3048V05F
IC590
AK93C45AF-W
X500
NAX0159-001X
8.00MHz
CN521
EMV7154-221E
K391
NQR0265-003X
L525
VQP0032-1R0Y
L526
VQP0032-1R0Y
RIN
AAGND
LIN
A5V
ROUT
D5.5V
LOUT
DGND
DOUT
DIN
M5.5V
MGND
RESET
COMMAND
STATUS
COMCLK
STSRDY
SET3
SET2
SET1
MODESE
1
2
3
4
5
6
A
B
C
D
E

NOTES

1. VOLTAGES ARE DC-MEASURED WITH A DIGITAL VOLT METER WITHOUT INPUT SIGNAL.
CONDITION --- STOP(PLAY)

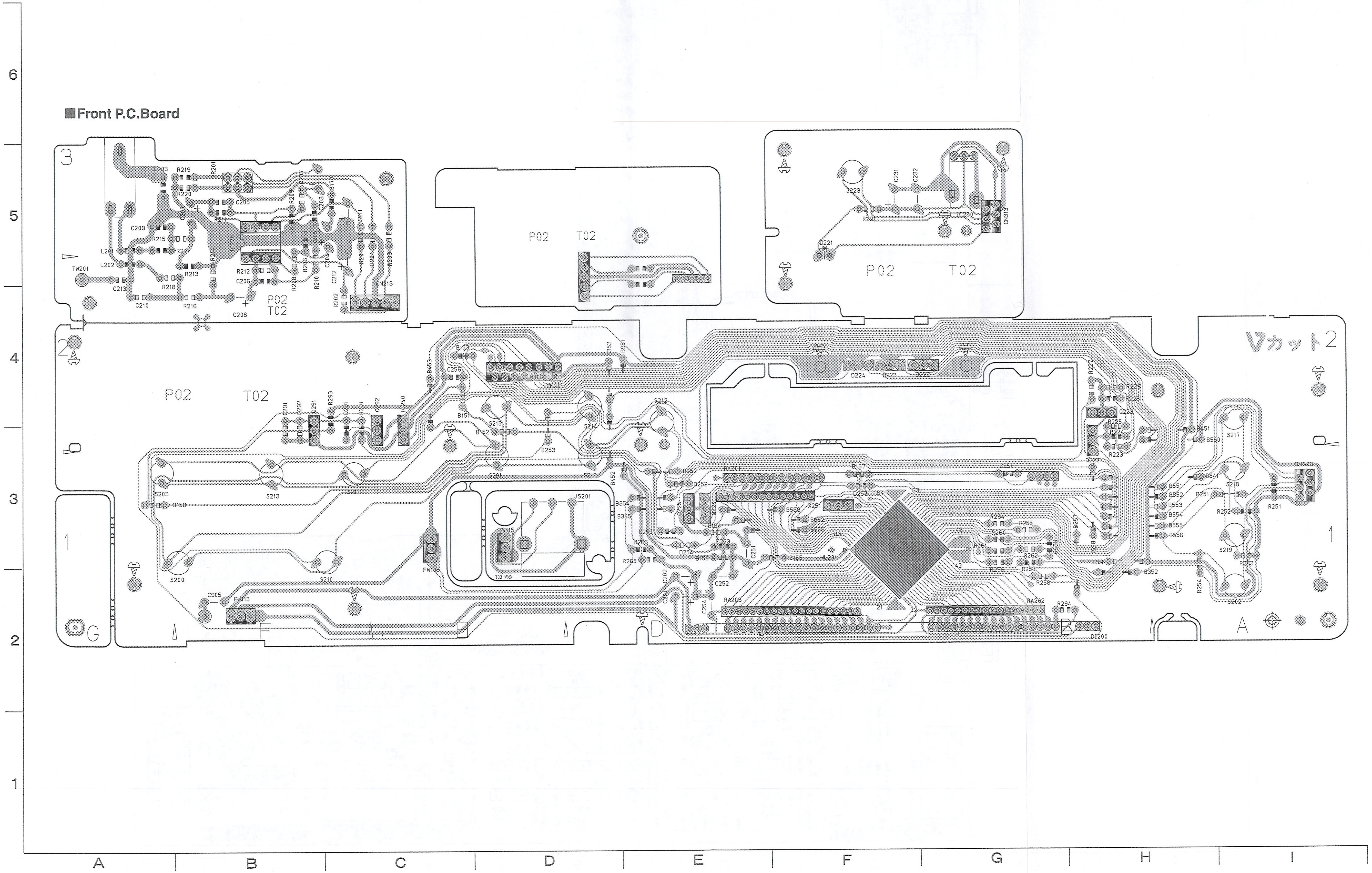
2. UNLESS OTHERWISE SPECIFIED.

ALL RESISTORS ARE 1/10W ±5% METAL GLAZE RESISTOR. OR 0.5% METAL FILM RESISTOR
ALL CAPACITORS ARE 50V CERAMIC CAPACITOR OR 50V MYLAR CAPACITOR.
ALL RESISTANCE VALUES ARE IN OHM(Ω).
ALL CAPACITANCE VALUES ARE IN μF(P=pF).
ALL E.CAPACITORS ARE SHOWN IN THE FORM OF CAPACITANCE(μF)/RATED VOLTAGE (V).
ALL INDUCTANCE VALUES ARE IN μH(m=mH).

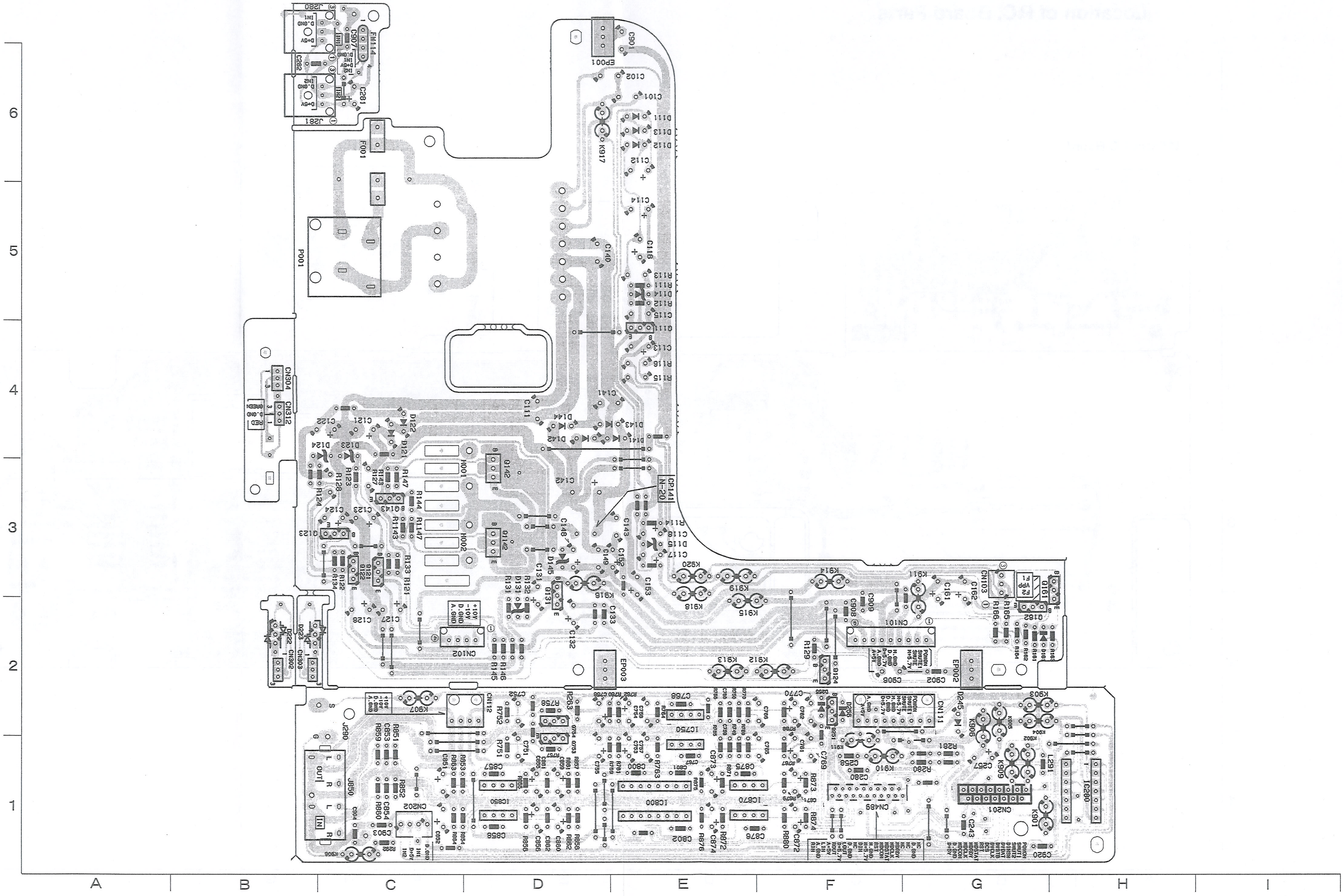
3. NI STANDS FOR NOT INSERTED PARTS.

Location of P.C. Board Parts

■Front P.C.Board


6
5
4
3
2
1
A
B
C
D
E
F
G
H
I
3
P02
T02
C203
R219
R220
R201
C205
C209
R215
L201
L202
TW201
C213
R218
R213
C210
R216
C208
R212
C206
IC220
CN213
R202
C212
R210
R204
R203
C211
C204
R214
R211
R217
2
1
G
S203
S200
S213
S211
S210
S201
S215
S216
S214
S212
B158
C905
FW113
FW105
FW115
JS201
B151
B152
B153
B253
C256
CN211
B353
B951
B452
B453
C291
D292
Q291
R293
D291
R291
Q292
IC240
B354
B355
D253
R266
R265
D252
D225
D227
B154
C253
D254
B156
C251
C202
C201
C252
C254
RA201
RA203
RA202
X251
B556
B552
B559
B155
HL281
B157
D255
R264
R255
R263
R261
R262
R256
R258
R294
D1200
D224
D223
D222
R227
R229
R228
Q223
R225
R224
R223
Q222
B351
B352
B557
B358
B451
B550
B551
B552
B553
B554
B555
B556
B641
B251
S217
S218
S219
S202
R252
R251
R253
R254
CN303
Vカット2
A
S223
C231
C232
R231
C234
CN313
Q221

■ Main Board


6
5
4
3
2
1
A
B
C
D
E
F
G
H
I

PARTS LIST

[XM-228BK]

* All printed circuit boards and its assemblies are not available as service parts.

Area Suffix

B ---------------------- U.K.
E ---- Continental Europe
EN ----- Northern Europe

- Contents -

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Electrical Parts List -- 4-6
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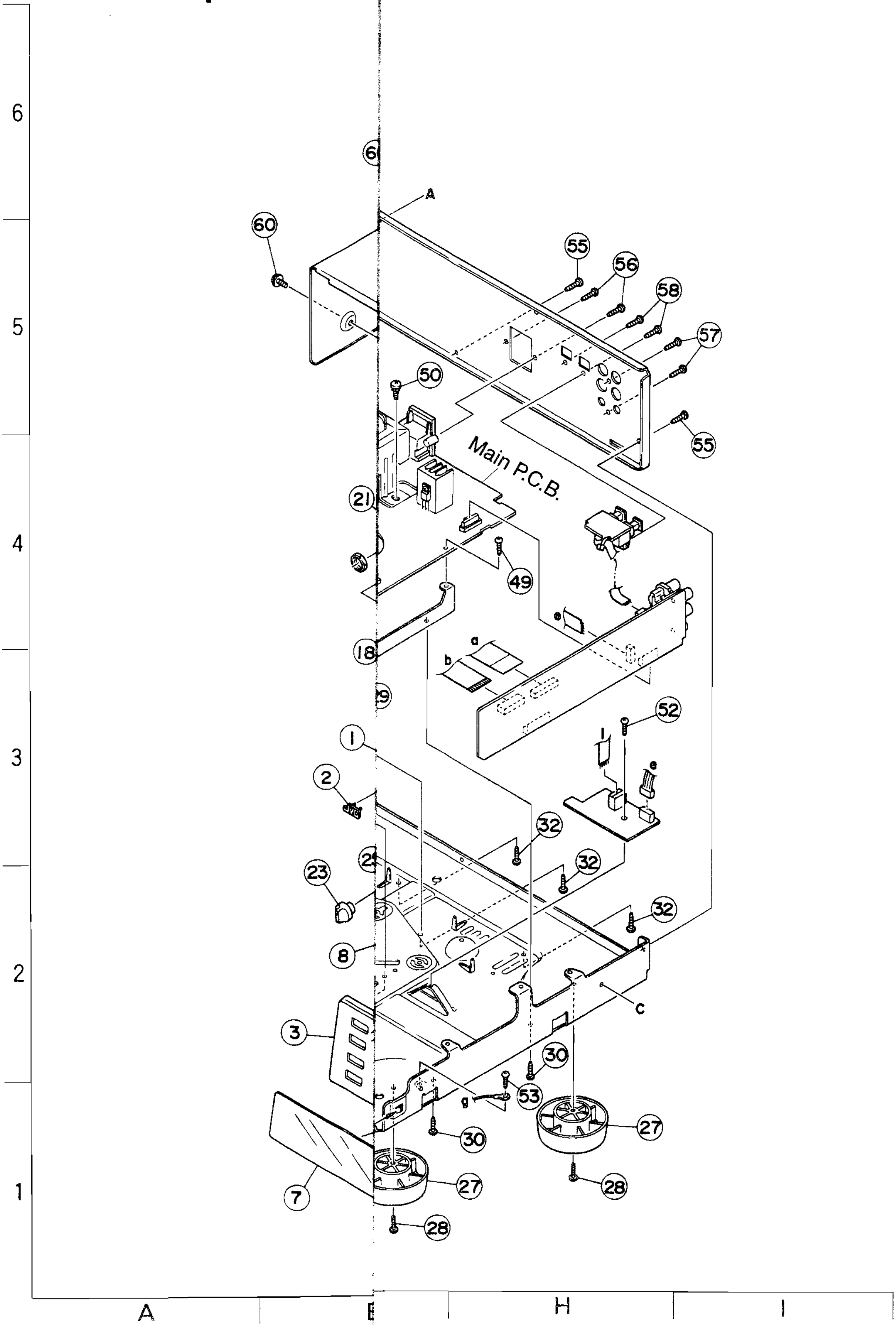
  MD Servo P.C.B. -- 4-9
  MD Loading P.C.B. -- 4-11
  MD Switch P.C.B. --- 4-11
Packing Materials and Accessories Parts List ------------------------------------ 4-12

<<MEMO>>

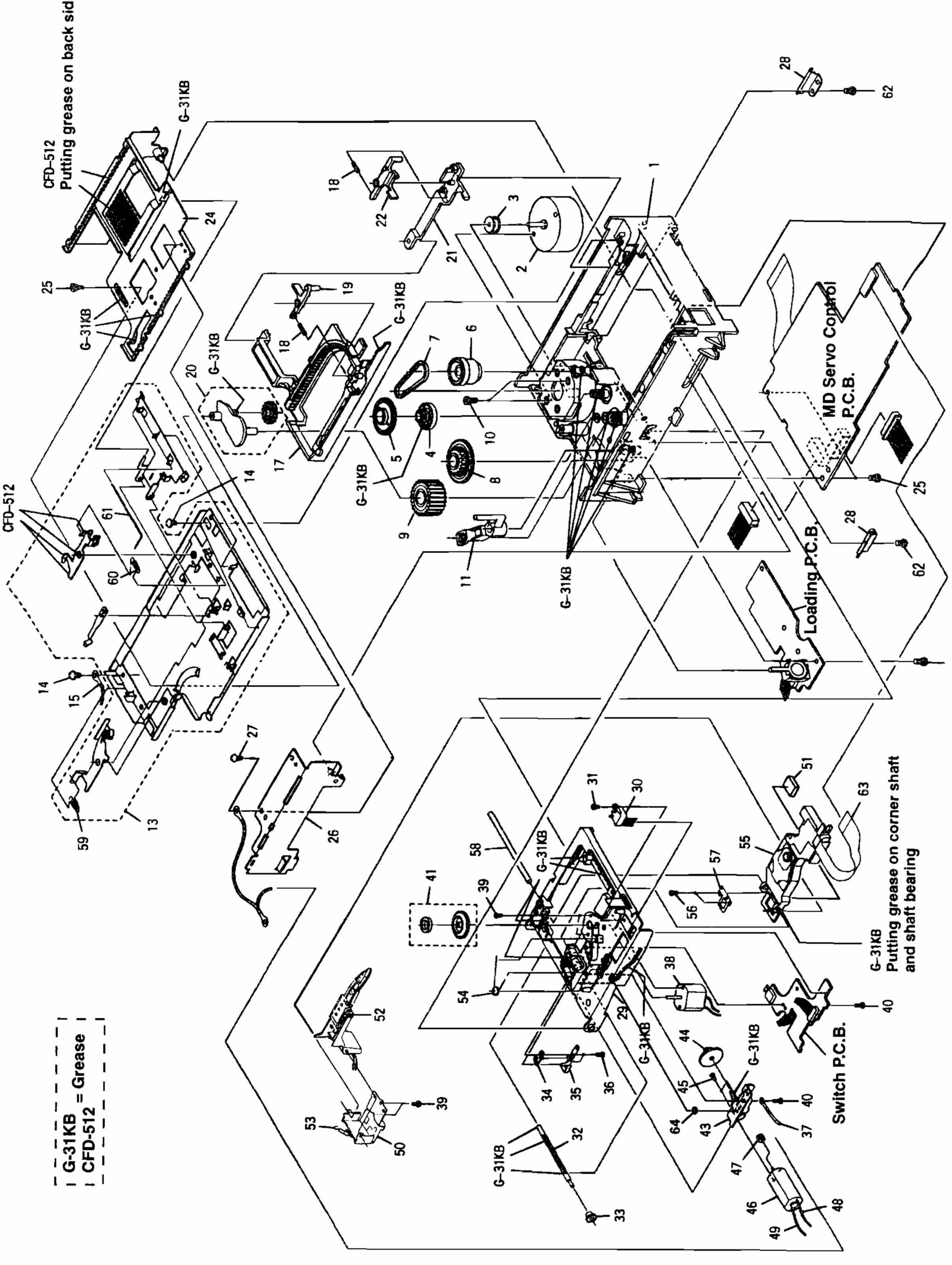
Exploded View


6
5
4
3
2
1
6
A
60
55
56
58
57
50
55
Main P.C.B.
21
49
18
a
b
9
52
1
e
2
32
25
32
23
32
8
c
3
30
53
g
27
30
7
27
28
28
A
B
H
I

Exploded View of MD Mechanism and Parts List

Block No. M 2 M M

EMU-401B


CFD-512
Putting grease on back side
G-31KB
24
25
G-31KB
CFD-512
61
60
14
15
59
13
20
G-31KB
17
18
19
G-31KB
14
18
22
21
3
2
1
7
6
10
5
4
G-31KB
8
9
11
G-31KB
27
26
28
62
MD Servo Control P.C.B.
25
28
62
Loading P.C.B.
12
41
39
58
G-31KB
31
30
54
38
29
G-31KB
52
39
53
50
34
35
36
32
G-31KB
33
44
45
G-31KB
40
64
43
37
47
46
48
49
57
56
55
51
63
G-31KB
Putting grease on corner shaft and shaft bearing
40
Switch P.C.B.
G-31KB = Grease
CFD-512 = Grease

■Parts List (MD Mechanism Ass'y)

Block No. M2MM

⚠	Item	Parts Number	Parts Name	Q'ty	Description	Area
	1	E103156-002	LOADING BASE	1		
	2	MSN5G543C	MOTOR	1		
	3	E75984-222SS	MOTOR PULLY	1		
	4	E409146-001	GEAR(5)	1		
	5	E409143-001	GEAR(2)	1		
	6	E409142-002	GEAR(1)	1		
	7	E75950-002	BELT	1		
	8	E409144-001	GEAR(3)	1		
	9	E409145-001	GEAR(4)	1		
	10	QYSPSPT2640Z	SCREW	2		
	11	E409149-002	SW LEVER	1		
	12	QYSBSF2606M	SCREW	1		
	13	E309825-010	CAR.BASE ASSY	1		
	14	QYSBSFG2606Z	SCREW	3		
	15	EWPZ01-027	TERMINAL WIRE	1		
	17	E208853-001	RACK	1		
	18	E409153-002	SPRING	2		
	19	E409152-002	HOOK(L)	1		
	20	E409195-002	P.GEAR ASSY	1		
	21	E309824-001	LINK	1		
	22	E409154-002	HOOK(R)	1		
	24	E309829-004KP	S.BKT(R)ASSY	1		
	25	E409163-001	SPECIAL SCREW	3		
	26	E409164-003	S.BKT(L)ASSY	1		
	27	QYSBST2606Z	T.SCREW	1		
	28	LV40591-001A	BRACKET	2		
	29	E103258-001	CHASSIS BASE	1		
	30	QSW0508-001	PUSH SW	1		
	31	QYSPSGT2035M	MINI SCREW	1		
	32	E409553-001	LEAD SCREW	1		
	33	E409542-001	GEAR F.LEAD	1		
	34	E409548-001	TH.PLATE	1		
	35	E409135-001	THRUST SPRING	1		
	36	E409332-001	SPECIAL SCREW	2		
	37	EWT025-008	TERMINAL WIRE	1		
	38	FF-110PH-08280	SP.MOTOR	1		
	39	QYSPSPU1720M	MINI SCREW	4		
	40	QYSPST2606Z	SCREW	2		
	41	LE30470-001A	TURN TABLE ASSY	1		
	43	E409129-005	M.BKT ASSY	1		
	44	E409133-001	MIDDLE GEAR	1		
	45	QYSPSPU1420Z	MINI SCREW	2		
	46	FF-N30VA-09210	FEED MOTOR	1		
	47	E409550-001	F.M.GEAR	1		
	48	QWE269-06BB	WIRE ASSY	1		
	49	QWE260-05BB	WIRE ASSY	1		
	50	E310179-001	H.JOINT	1		
	51	LE30001-008A	SPACER	1		
	52	HMD-7B	HEAD UNIT	1		
	53	E409158-004	SPRING	1		
	54	E409165-001	M.SPRING	1		
	55	KMS-260C	MD PICK UNIT	1		
	56	QYSPSPT1414Z	SCREW	2		
	57	E408255-003	RACK SPRING	1		
	58	E409141-001	GUIDE SHAFT	1		
	59	E409158-002	SPRING	1		
	60	E409158-003	SPRING	1		
	61	E409167-001	SPRING BAR	1		
	62	QYSBSF2606M	SCREW	2		
	63	EMW40008-001	FPC CABLE	1		
	64	QYWFM266013	WASHER	1		

■Electrical Parts List(Main P.C.B.)

⚠	Item	Parts Number	Description	Area
		I.C.S		
	IC280	TC74HC00AP	I.C(DIGI-MOS)	
	IC750	NJM4580DD	I.C(MONO-ANALOG)	
	IC800	TC9413AP	I.C(M)	
	IC850	NJM4580DD	I.C(MONO-ANALOG)	
	IC870	NJM4580DD	I.C(MONO-ANALOG)	
		DIODES		
	D111	11E2-T5	SILICON	
	D112	11E2-T5	SILICON	
	D113	11E2-T5	SILICON	
	D115	MTZJ6.2C-T2	ZENER	
	D116	MTZJ33C-T2	ZENER	
	D121	11E2-T5	SILICON	
	D122	11E2-T5	SILICON	
	D123	MTZJ10C-T2	ZENER DIODE	
	D124	MTZJ10C-T2	ZENER DIODE	
	D131	MTZJ5.6C-T2	ZENER	
	D141	11E2-T5	SILICON	
	D142	11E2-T5	SILICON	
	D143	11E2-T5	SILICON	
	D144	11E2-T5	SILICON	
	D145	MTZJ6.2C-T2	ZENER	
	D161	1SS133-T2	SI.DIODE	
	D245	11E2-T5	SILICON	
	D255	1SS133-T2	SI.DIODE	
	D256	1SS133-T2	SI.DIODE	
		TRANSISTORS		
	Q111	2SA934/QR/-T	SILICON	
	Q121	2SD2037/EF/-T	SILICON	
	Q122	2SA934/QR/-T	SILICON	
	Q123	DTC114ES	DIGITAL TRANSISTOR	
	Q124	DTA114WS	DIGITAL TRANSISTOR	
	Q131	2SC2060/QR/-T	SILICON	
	Q142	2SB1565/EF/	SILICON	
	Q143	2SC1740S/RS/-T	SI.TRANSISTOR	
	Q161	2SA933S/RS/-T	SILICON	
	Q162	2SD2144S/VW/-T	SILICON	
	Q251	DTA114ES	DIGITAL TRANSISTOR	
	Q753	2SD1302/ST/-T	SILICON	
	Q754	2SD1302/ST/-T	SILICON	
		CAPACITORS		
	C101	QFLB1HJ-104	0.1MF 50V MYLAR CAP.	
	C102	QFLB1HJ-104	0.1MF 50V MYLAR CAP.	
	C111	QFLB1HJ-104	0.1MF 50V MYLAR CAP.	
	C112	QETB1VM-477E	470MF 35V AL E.CAP.	
	C113	QETB1HM-226E	22MF 50V E.CAP.	
	C114	QETB1CM-477M	470MF 16V E.CAP.	
	C115	QCF31HZ-103Z	0.01MF 50V CERAMIC	
	C116	QETB1HM-227	220MF 50V E.CAP.	
	C117	QTE1H28-475Z	E.CAP.	
	C118	QETB1HM-226E	22MF 50V E.CAP.	
⚠	C121	QETB1CM-108	1000MF 16V AL E.CAP.	
	C122	QETB1CM-477M	470MF 16V E.CAP.	
	C123	QETB1CM-476	47MF 16V AL E.CAP.	
	C124	QETB1CM-476	47MF 16V AL E.CAP.	
	C127	QETC1CM-227Z	220MF 16V AL E.CAP.	
	C128	QETC1CM-227Z	220MF 16V AL E.CAP.	
	C131	QETB1CM-476	47MF 16V AL E.CAP.	
	C132	QETC1AM-107ZN	100MF 10V E.CAP.	
	C141	QFLB1HJ-104	0.1MF 50V MYLAR CAP.	
	C142	QETB1CM-688	6800MF 16V E.CAP.	
	C143	QCF31HZ-223Z	0.022MF 50V CERAMIC	
	C148	QETC1AM-107ZN	100MF 10V E.CAP.	
	C149	QCF31HZ-223Z	0.022MF 50V CERAMIC	
	C152	QETC1AM-107ZN	100MF 10V E.CAP.	
	C153	QETC1AM-107ZN	100MF 10V E.CAP.	

⚠	Item	Parts Number	Description	Area
	C161	QETB1EM-476	47MF 25V AL E.CAP.	
	C162	QETC1CM-227Z	220MF 16V AL E.CAP.	
	C243	QDYB1CM-103Y	0.01MF 16V C CAP.	
	C281	QETC1AM-107ZN	100MF 10V E.CAP.	
	C282	QDVB1EZ-223Y	0.022MF 25V C CAP.	
	C751	QFN81HJ-102	1000PF 50V METAL.MYLAR	
	C752	QFN81HJ-102	1000PF 50V METAL.MYLAR	
	C753	QTE1E28-476Z	E.CAPA. I.M	
	C754	QTE1E28-476Z	E.CAPA. I.M	
	C755	QTE1E28-476Z	E.CAPA. I.M	
	C756	QTE1E28-476Z	E.CAPA. I.M	
	C759	QCBB1HK-561Y	560PF 50V CER.CAP.	
	C760	QCBB1HK-561Y	560PF 50V CER.CAP.	
	C761	QTE1H28-475Z	E CAP.	
	C762	QTE1H28-475Z	E CAP.	
	C765	QFN81HJ-821	820PF 50V MYLAR CAP.	
	C766	QFN81HJ-821	820PF 50V MYLAR CAP.	
	C800	QDVB1EZ-223Y	0.022MF 25V C CAP.	
	C801	QDVB1EZ-223Y	0.022MF 25V C CAP.	
	C802	QDVB1EZ-223Y	0.022MF 25V C CAP.	
	C851	QTE1E28-476Z	E.CAPA. I.M	
	C852	QTE1E28-476Z	E.CAPA. I.M	
	C853	QCBB1HK-101Y	100PF 50V CER.CAP.	
	C854	QCBB1HK-101Y	100PF 50V CER.CAP.	
	C855	QTE1E28-476Z	E.CAPA. I.M	
	C856	QTE1E28-476Z	E.CAPA. I.M	
	C859	QTE1H28-475Z	E CAP.	
	C860	QTE1H28-475Z	E CAP.	
	C871	QTE1H28-106Z	E CAP.	
	C872	QTE1H28-106Z	E CAP.	
	C873	QTE1E28-476Z	E.CAPA. I.M	
	C874	QTE1E28-476Z	E.CAPA. I.M	
	C901	QCZ0205-155	1.5MF 25V C.CAP.	
	C902	QDVB1EZ-223Y	0.022MF 25V C CAP.	
	C903	QDVB1EZ-223Y	0.022MF 25V C CAP.	
	C906	QCZ0205-155	1.5MF 25V C.CAP.	
	C920	QDVB1EZ-223Y	0.022MF 25V C CAP.	
		RESISTORS		
	R111	QRJ146J-331X	330 1/4W R.NETWORK	
	R112	QRJ146J-331X	330 1/4W R.NETWORK	
	R113	QRZ9005-100X	10 FUSIBLE	
	R114	QRE141J-223Y	22K 1/4W R.NETWORK	
	R115	QRJ146J-3R3X	3.3 1/4W R.NETWORK	
	R116	QRJ146J-3R3X	3.3 1/4W R.NETWORK	
	R117	QRE141J-2R2Y	2.2 1/4W R.NETWORK	
	R118	QRE141J-2R2Y	2.2 1/4W R.NETWORK	
	R121	QRE141J-681Y	680 1/4W R.NETWORK	
	R122	QRE141J-681Y	680 1/4W R.NETWORK	
	R123	QRE141J-271Y	270 1/4W R.NETWORK	
	R124	QRE141J-271Y	270 1/4W R.NETWORK	
	R127	QRZ9006-4R7X	4.7 FUSIBLE	
	R128	QRZ9006-4R7X	4.7 FUSIBLE	
	R131	QRE141J-681Y	680 1/4W R.NETWORK	
	R132	QRE141J-181Y	180 1/4W R.NETWORK	
	R143	QRE141J-101Y	100 1/4W R.NETWORK	
	R144	QRE141J-221Y	220 1/4W R.NETWORK	
	R145	QRE141J-102Y	1K 1/4W R.NETWORK	
	R146	QRE141J-102Y	1K 1/4W R.NETWORK	
	R147	QRE141J-221Y	220 1/4W R.NETWORK	
	R161	QRE141J-103Y	10K 1/4W CARBON RES.	
	R162	QRE141J-333Y	33K 1/4W R.NETWORK	
	R163	QRE141J-221Y	220 1/4W R.NETWORK	
	R164	QRE141J-221Y	220 1/4W R.NETWORK	
	R165	QRE141J-223Y	22K 1/4W R.NETWORK	
	R166	QRE141J-223Y	22K 1/4W R.NETWORK	
	R263	QRE141J-154Y	150K 1/4W R.NETWORK	

■Electrical Parts List(Main P.C.B.)

⚠	Item	Parts Number	Description	Area
	R292	QRE141J-101Y	100 1/4W R.NETWORK	
	R749	QRE141J-272Y	2.7K 1/4W R.NETWORK	
	R750	QRE141J-272Y	2.7K 1/4W R.NETWORK	
	R751	QRE141J-151Y	150 1/4W R.NETWORK	
	R752	QRE141J-151Y	150 1/4W R.NETWORK	
	R757	QRE141J-103Y	10K 1/4W CARBON RES.	
	R758	QRE141J-103Y	10K 1/4W CARBON RES.	
	R759	QRE141J-681Y	680 1/4W R.NETWORK	
	R760	QRE141J-681Y	680 1/4W R.NETWORK	
	R761	QRE141J-104Y	100K 1/4W R.NETWORK	
	R762	QRE141J-104Y	100K 1/4W R.NETWORK	
	R763	QRE141J-912Y	9.1K 1/4W R.NETWORK	
	R764	QRE141J-912Y	9.1K 1/4W R.NETWORK	
	R765	QRE141J-273Y	27K 1/4W R.NETWORK	
	R766	QRE141J-273Y	27K 1/4W R.NETWORK	
	R767	QRE141J-104Y	100K 1/4W R.NETWORK	
	R768	QRE141J-104Y	100K 1/4W R.NETWORK	
	R769	QRE141J-272Y	2.7K 1/4W R.NETWORK	
	R770	QRE141J-272Y	2.7K 1/4W R.NETWORK	
	R851	QRE141J-473Y	47K 1/4W R.NETWORK	
	R852	QRE141J-473Y	47K 1/4W R.NETWORK	
	R853	QRE141J-123Y	12K 1/4W R.NETWORK	
	R854	QRE141J-123Y	12K 1/4W R.NETWORK	
	R855	QRE141J-153Y	15K 1/4W R.NETWORK	
	R856	QRE141J-153Y	15K 1/4W R.NETWORK	
	R857	QRE141J-221Y	220 1/4W R.NETWORK	
	R858	QRE141J-221Y	220 1/4W R.NETWORK	
	R859	QRE141J-302Y	3K 1/4W R.NETWORK	
	R860	QRE141J-302Y	3K 1/4W R.NETWORK	
	R861	QRE141J-104Y	100K 1/4W R.NETWORK	
	R862	QRE141J-104Y	100K 1/4W R.NETWORK	
	R863	QRE141J-473Y	47K 1/4W R.NETWORK	
	R864	QRE141J-473Y	47K 1/4W R.NETWORK	
	R871	QRE141J-103Y	10K 1/4W CARBON RES.	
	R872	QRE141J-103Y	10K 1/4W CARBON RES.	
	R873	QRE141J-221Y	220 1/4W R.NETWORK	
	R874	QRE141J-221Y	220 1/4W R.NETWORK	
	R875	QRE141J-104Y	100K 1/4W R.NETWORK	
	R876	QRE141J-104Y	100K 1/4W R.NETWORK	
	R879	QRE141J-182Y	1.8K 1/4W R.NETWORK	
	R880	QRE141J-182Y	1.8K 1/4W R.NETWORK	
		OTHERS		
		QYSBSG3008Z	T.SCREW	
	H001	E70945-H35	HEAT SINK	
	J280	GP1F32R	OPTICAL JACK	
	J281	GP1F32R	OPTICAL JACK	
	J290	QNS0016-001	3.5 JACK	
	J850	QNN0173-001	PIN JACK	
	K910	QQR0601-001Z	F.BEADS I.M	
	K911	QQR0601-001Z	F.BEADS I.M	
	K914	QQR0601-001Z	F.BEADS I.M	
	L291	QQL231K-1R0Y	INDUCTOR I.M	
	P001	QNC0051-001	AC INLET	
	CN101	QGB2510J1-09	CONNECTOR	
	CN102	QGB2510J1-04	CONNECTOR	
	CN103	QGD2501C1-03Z	SOCKET I.M	
	CN111	QGB2510K2-09	CONNECTOR	
	CN112	QGB2510K2-04	CONNECTOR	
	CN201	QGF1205C1-15	CONNECTOR	
	CN202	QGD2501C1-04Z	SOCKET I.M	
	CN203	QJK004-051300	CONNECTOR WIRE ASSY	
	CN489	QGF1016C1-21	CONNECTOR	
	CP141	ICP-N20-T	I.C. PROTECTOR	
	CP901	ICP-N20-T	I.C. PROTECTOR	
	CP902	ICP-N25-T	I.C. PROTECTOR	
	CP903	ICP-N50-T	I.C. PROTECTOR	

⚠	Item	Parts Number	Description	Area
	EP001	QNZ0136-001Z	IM EARTH PLATE	
	EP002	QNZ0136-001Z	IM EARTH PLATE	
	FW114	EWR34B-06LST	FLAT WIRE ASSY	

■Electrical Parts List(System Micon P.C.B.)

⚠	Item	Parts Number	Description	Area
		I.C.S		
	IC220	NJM4580DD	I.C(MONO-ANALOG)	
	IC230	GP1U271X	INFRARED DETECT UNIT	
	IC240	IC-PST593/G/-T	I.C(M)	
	IC250	MN173222AS	I.C(M)	
		DIODES		
	D221	SLR-342VC-T	L.E.D.	
	D222	SPR-325MVW/L/-T	L.E.D.	
	D223	SPR-325MVW/L/-T	L.E.D.	
	D224	SPR-325MVW/L/-T	L.E.D.	
	D251	1SS133-T2	SI.DIODE	
	D252	1SS133-T2	SI.DIODE	
	D253	1SS133-T2	SI.DIODE	
	D254	1SS133-T2	SI.DIODE	
	D255	1SS133-T2	SI.DIODE	
	D291	1SS133-T2	SI.DIODE	
	D292	1SS133-T2	SI.DIODE	
		TRANSISTORS		
	Q222	DTA114YS-T	SILICON	
	Q223	DTA114YS-T	SILICON	
	Q224	DTC114YS-T	SILICON	
	Q225	DTC114YS-T	SILICON	
	Q291	DTC114ES	DIGITAL TRANSISTOR	
	Q292	DTA114ES	DIGITAL TRANSISTOR	
		CAPACITORS		
	C201	QER61HM-105Z	1MF 50V AL E.CAP.	
	C202	QER61HM-105Z	1MF 50V AL E.CAP.	
	C203	QEKC1HM-475Z	4.7MF 50V ELECTRO	
	C204	QEKC1HM-475Z	4.7MF 50V ELECTRO	
	C205	QCBB1HK-181Y	180PF 50V CER.CAP.	
	C206	QCBB1HK-181Y	180PF 50V CER.CAP.	
	C207	QEKC1CM-476Z	47MF 16V ELECTRO	
	C208	QEKC1CM-476Z	47MF 16V ELECTRO	
	C209	QDYB1CM-103Y	0.01MF 16V C CAP.	
	C210	QDYB1CM-103Y	0.01MF 16V C CAP.	
	C211	QEKC1CM-476Z	47MF 16V ELECTRO	
	C212	QEKC1CM-476Z	47MF 16V ELECTRO	
	C213	QDVB1EZ-223Y	0.022MF 25V C CAP.	
	C231	QEKC1AM-336Z	33MF 10V ELECTRO	
	C232	QDX31EM-223Z	0.022MF 25V C CAP.	
	C251	QFV61HJ-104Z	0.1MF 50V T.FILM	
	C252	QER61AM-226Z	22MF 10V ELECTRO	
	C253	QDYB1CM-103Y	0.01MF 16V C CAP.	
	C254	QFV61HJ-104Z	0.1MF 50V T.FILM	
	C256	QDYB1CM-103Y	0.01MF 16V C CAP.	
	C291	QCBB1HK-331Y	330PF 50V CER.CAP.	
	C905	QDX31EM-223Z	0.022MF 25V C CAP.	
		RESISTORS		
	R201	QRE141J-331Y	330 1/4W R.NETWORK	
	R202	QRE141J-331Y	330 1/4W R.NETWORK	
	R203	QRE141J-182Y	1.8K 1/4W R.NETWORK	
	R204	QRE141J-182Y	1.8K 1/4W R.NETWORK	
	R205	QRE141J-104Y	100K 1/4W R.NETWORK	
	R206	QRE141J-104Y	100K 1/4W R.NETWORK	
	R207	QRE141J-103Y	10K 1/4W CARBON RES.	
	R208	QRE141J-103Y	10K 1/4W CARBON RES.	
	R209	QRE141J-103Y	10K 1/4W CARBON RES.	
	R210	QRE141J-103Y	10K 1/4W CARBON RES.	
	R211	QRE141J-183Y	18K 1/4W CARBON RES.	
	R212	QRE141J-183Y	18K 1/4W CARBON RES.	
	R213	QRE141J-473Y	47K 1/4W R.NETWORK	
	R214	QRE141J-473Y	47K 1/4W R.NETWORK	
	R215	QRE141J-390Y	39 1/4W R.NETWORK	
	R216	QRE141J-390Y	39 1/4W R.NETWORK	
	R217	QRE141J-390Y	39 1/4W R.NETWORK	
	R218	QRE141J-390Y	39 1/4W R.NETWORK	
	R219	QRE141J-151Y	150 1/4W R.NETWORK	
	R220	QRE141J-151Y	150 1/4W R.NETWORK	
	R221	QRE141J-681Y	680 1/4W R.NETWORK	
	R223	QRE141J-331Y	330 1/4W R.NETWORK	
	R224	QRE141J-331Y	330 1/4W R.NETWORK	
	R225	QRE141J-331Y	330 1/4W R.NETWORK	
	R227	QRE141J-471Y	470 1/4W R.NETWORK	
	R228	QRE141J-471Y	470 1/4W R.NETWORK	
	R229	QRE141J-471Y	470 1/4W R.NETWORK	
	R251	QRE141J-103Y	10K 1/4W CARBON RES.	
	R252	QRE141J-103Y	10K 1/4W CARBON RES.	
	R253	QRE141J-103Y	10K 1/4W CARBON RES.	
	R254	QRE141J-103Y	10K 1/4W CARBON RES.	
	R255	QRE141J-103Y	10K 1/4W CARBON RES.	
	R256	QRE141J-151Y	150 1/4W R.NETWORK	
	R257	QRE141J-151Y	150 1/4W R.NETWORK	
	R258	QRE141J-151Y	150 1/4W R.NETWORK	
	R259	QRE141J-151Y	150 1/4W R.NETWORK	
	R260	QRE141J-151Y	150 1/4W R.NETWORK	
	R261	QRE141J-151Y	150 1/4W R.NETWORK	
	R262	QRE141J-151Y	150 1/4W R.NETWORK	
	R264	QRE141J-104Y	100K 1/4W R.NETWORK	
	R265	QRE141J-103Y	10K 1/4W CARBON RES.	
	R266	QRE141J-103Y	10K 1/4W CARBON RES.	
	R281	QRE141J-822Y	8.2K 1/4W R.NETWORK	
	R282	QRE141J-822Y	8.2K 1/4W R.NETWORK	
	R291	QRE141J-101Y	100 1/4W R.NETWORK	
	R293	QRE141J-472Y	4.7K 1/4W R.NETWORK	
	R294	QRE141J-104Y	100K 1/4W R.NETWORK	
	VR201	QVQ0030-A24	20K VARIABLE RES.	
		OTHERS		
		LV30225-002A	TUBE SPACER	
	J201	QNS0065-001	6.3 JACK	
	L201	QQL231K-1R0Y	INDUCTOR I.M	
	L202	QQL231K-1R0Y	INDUCTOR I.M	
	L203	QQL231K-1R0Y	INDUCTOR I.M	
	S200	QSW0683-001Z	PUSH SWITCH	
	S201	QSW0683-001Z	PUSH SWITCH	
	S202	QSW0683-001Z	PUSH SWITCH	
	S203	QSW0683-001Z	PUSH SWITCH	
	S210	QSW0683-001Z	PUSH SWITCH	
	S211	QSW0683-001Z	PUSH SWITCH	
	S212	QSW0683-001Z	PUSH SWITCH	
	S213	QSW0683-001Z	PUSH SWITCH	
	S214	QSW0683-001Z	PUSH SWITCH	
	S215	QSW0683-001Z	PUSH SWITCH	
	S216	QSW0683-001Z	PUSH SWITCH	
	S217	QSW0683-001Z	PUSH SWITCH	
	S218	QSW0683-001Z	PUSH SWITCH	
	S219	QSW0683-001Z	PUSH SWITCH	
	S223	QSW0683-001Z	PUSH SWITCH	
	X251	QAX0112-001Z	RESONATOR I.M	
	CN211	QGF1205F1-15	CONNECTOR	
	CN213	QUM105-40Z4DG	FLAT WIRE	
	CN214	QGD2501C1-05Z	SOCKET I.M	
	CN215	QGA2001C1-05	5P PLUG ASSY	
	CN303	QGF1205F1-06	CONNECTOR	
	CN313	QGF1205F1-06	CONNECTOR	
	DI200	QLF0052-001	FLUORESCENT DISPLAY TUBE	
	FW113	EWR33B-16LST	FLAT WIRE	
	FW115	QUM023-08Z3Z3	FLAT WIRE	
	JS201	QSW0446-001	ROTARY SWITCH	
	TW201	EWT015-009	TERMINAL WIRE ASSY	
	TW921	EWT015-009	TERMINAL WIRE ASSY	

■Electrical Parts List (MD Servo P.C.B.)

⚠	Item	Parts Number	Description	Area
		I.C.S		
	IC310	CXA2523AR	IC(M)	
	IC340	TC7S08F-W	IC(M)	
	IC350	CXD2652AR	IC(M)	
	IC390	MN41V4400TT-08	IC(M)	
	IC410	M56758FP-X	IC(M)	
	IC450	BD7910FV-X	IC(M)	
	IC480	AK4520A-VF-X	IC(M)	
	IC485	TK71340M-W	IC(M)	
	IC500	HD6433045SV06F	MPU	
	IC590	AK93C45AF-W	IC(M)	
		DIODES		
	D310	1SS355-X	SI DIODE	
	D451	SC802-06-X	DIODE	
	D452	SC802-06-X	DIODE	
		TRANSISTORS		
	Q330	2SA1362/G/-X	TR.	
	Q331	DTA114EKA-X	TR.	
	Q332	DTA113ZKA-X	TR.	
	Q333	DTA113ZKA-X	TR.	
	Q400	2SA1363/EF/-X	TR.	
	Q401	2SC2411K/QR/-X	TR.	
	Q402	DTA113ZKA-X	TR.	
		CAPACITORS		
	C300	NCF31CZ-104X	0.1MF 16V CER.CAP.	
	C302	NCF31CZ-104X	0.1MF 16V CER.CAP.	
	C307	NCB31HK-222X	2200PF 50V CER.CAP.	
	C310	NCB31HK-102X	1000PF 50V CER.CAP.	
	C311	NCF21CZ-105X	1MF 16V CER.CAP.	
	C312	NEA20GM-476NZ	47MF 4V E.CAP.	
	C314	NCB31CK-223X	0.022MF 16V CER.CAP.	
	C315	NCB31HK-102X	1000PF 50V CER.CAP.	
	C316	NCF21CZ-105X	1MF 16V CER.CAP.	
	C318	NCB31HK-682X	6800PF 50V CER.CAP.	
	C319	NCB31CK-333X	0.033MF 16V CER.CAP.	
	C320	NCB21AK-105X	1MF 10V CER.CAP.	
	C321	NCB31HK-472X	4700PF 50V CER.CAP.	
	C322	NCB21AK-105X	1MF 10V CER.CAP.	
	C323	NCB31HK-682X	6800PF 50V CER.CAP.	
	C324	NCB21CK-224X	0.22MF 16V CER.CAP.	
	C325	NCB31CK-103X	0.01MF 16V CER.CAP.	
	C326	NCB31CK-223X	0.022MF 16V CER.CAP.	
	C327	NCB31CK-104X	0.1MF 16V CER.CAP.	
	C328	NCB31CK-104X	0.1MF 16V CER.CAP.	
	C330	NCF31CZ-104X	0.1MF 16V CER.CAP.	
	C333	NCF31CZ-104X	0.1MF 16V CER.CAP.	
	C334	NCF31CZ-104X	0.1MF 16V CER.CAP.	
	C340	NCB31CK-223X	0.022MF 16V CER.CAP.	
	C341	NCB31CK-223X	0.022MF 16V CER.CAP.	
	C342	NCF31CZ-104X	0.1MF 16V CER.CAP.	
	C350	NEA20GM-476NZ	47MF 4V E.CAP.	
	C351	NCF21CZ-105X	1MF 16V CER.CAP.	
	C352	NEA20GM-476NZ	47MF 4V E.CAP.	
	C353	NCF21CZ-105X	1MF 16V CER.CAP.	
	C354	NCF21CZ-105X	1MF 16V CER.CAP.	
	C355	NCF31CZ-104X	0.1MF 16V CER.CAP.	
	C356	NCF31CZ-104X	0.1MF 16V CER.CAP.	
	C357	NCS21HJ-100X	10PF 50V CER.CAP.	
	C358	NCS21HJ-100X	10PF 50V CER.CAP.	
	C359	NCF31CZ-104X	0.1MF 16V CER.CAP.	
	C361	NCF31CZ-104X	0.1MF 16V CER.CAP.	
	C371	NCS31HJ-100X	10PF 50V CER.CAP.	
	C372	NCS31HJ-100X	10PF 50V CER.CAP.	
	C375	NCB31CK-103X	0.01MF 16V CER.CAP.	
	C376	NCB21CK-474X	0.47MF 16V CER.CAP.	
	C377	NCS31HJ-471X	470PF 50V CER.CAP.	
	C379	NCB21CK-474X	0.47MF 16V CER.CAP.	
	C380	NCB31CK-153X	0.015MF 16V CER.CAP.	
	C381	NCF31CZ-104X	0.1MF 16V CER.CAP.	
	C382	NCF31CZ-104X	0.1MF 16V CER.CAP.	
	C390	NCF21CZ-105X	1MF 16V CER.CAP.	
	C400	NEA20JM-226NZ	22MF 6.3V E.CAP.	
	C401	NEA20JM-107NZ	100MF 6.3V E.CAP.	
	C402	NCB31HK-331X	330PF 50V CER.CAP.	
	C403	NEA20GM-476NZ	47MF 4V E.CAP.	
	C404	NCF31CZ-104X	0.1MF 16V CER.CAP.	
	C410	NEA20JM-107NZ	100MF 6.3V E.CAP.	
	C411	NCF31AZ-105X	1MF 10V CER.CAP.	
	C412	NCF31CZ-104X	0.1MF 16V CER.CAP.	
	C421	NCB31HK-561X	560PF 50V CER.CAP.	
	C423	NCB31HK-561X	560PF 50V CER.CAP.	
	C425	NCB31HK-561X	560PF 50V CER.CAP.	
	C427	NCB31HK-561X	560PF 50V CER.CAP.	
	C429	NCB31HK-102X	1000PF 50V CER.CAP.	
	C431	NCB31HK-102X	1000PF 50V CER.CAP.	
	C433	NCB31HK-562X	5600PF 50V CER.CAP.	
	C435	NCB31HK-562X	5600PF 50V CER.CAP.	
	C437	NCB31CK-103X	0.01MF 16V CER.CAP.	
	C439	NCB31CK-103X	0.01MF 16V CER.CAP.	
	C450	NEA20JM-107NZ	100MF 6.3V E.CAP.	
	C451	NEA20GM-107NZ	100MF 4V E.CAP.	
	C452	NCF31CZ-104X	0.1MF 16V CER.CAP.	
	C453	NCF31CZ-104X	0.1MF 16V CER.CAP.	
	C455	NDC32AJ-101X	1D0PF 100V CER.CAP.	
	C480	NEA20JM-476NZ	47MF 6.3V E.CAP.	
	C481	NCF21CZ-105X	1MF 16V CER.CAP.	
	C482	NEA20JM-226NZ	22MF 6.3V E.CAP.	
	C483	NCF31CZ-104X	0.1MF 16V CER.CAP.	
	C484	NEA21CM-106NZ	10MF 16V E.CAP.	
	C485	NCF31CZ-104X	0.1MF 16V CER.CAP.	
	C486	NCF31CZ-104X	0.1MF 16V CER.CAP.	
	C487	NCF31CZ-104X	0.1MF 16V CER.CAP.	
	C488	NEA21CM-106NZ	10MF 16V E.CAP.	
	C490	NCB31CK-103X	0.01MF 16V CER.CAP.	
	C491	NCB31HK-222X	2200PF 50V CER.CAP.	
	C492	NCB31HK-222X	2200PF 50V CER.CAP.	
	C493	NCF21CZ-105X	1MF 16V CER.CAP.	
	C501	NCS21HJ-220X	22PF 50V CER.CAP.	
	C502	NCS21HJ-220X	22PF 50V CER.CAP.	
	C511	NCF31CZ-104X	0.1MF 16V CER.CAP.	
	C512	NCF31CZ-104X	0.1MF 16V CER.CAP.	
	C515	NCF31CZ-104X	0.1MF 16V CER.CAP.	
	C591	NCF31CZ-104X	0.1MF 16V CER.CAP.	
		RESISTORS		
	R300	NRSA63J-0R0X	RESISTOR	
	R301	NRSA63J-0R0X	RESISTOR	
	R302	NRSA63J-0R0X	RESISTOR	
	R303	NRSA63J-122X	1.2K RESISTOR	
	R305	NRSA63J-222X	2.2K RESISTOR	
	R306	NRSA63J-474X	470K RESISTOR	
	R309	NRSA63J-474X	470K RESISTOR	
	R310	NRSA63J-331X	330 RESISTOR	
	R311	NRSA63J-183X	18K RESISTOR	
	R312	NRSA63J-103X	10K RESISTOR	
	R313	NRSA63J-104X	100K RESISTOR	
	R314	NRSA63J-133X	13K RESISTOR	
	R315	NRSA63J-243X	24K RESISTOR	
	R316	NRSA63J-104X	100K RESISTOR	
	R317	NRSA63J-103X	10K RESISTOR	
	R320	NRSA63J-563X	56K RESISTOR	
	R321	NRSA63J-331X	330 RESISTOR	
	R322	NRSA63J-331X	330 RESISTOR	
	R323	NRSA63J-331X	330 RESISTOR	
	R324	NRSA63J-102X	1.0K RESISTOR	
	R325	NRSA63J-472X	4.7K RESISTOR	
	R326	NRSA63J-331X	330 RESISTOR	
	R327	NRSA63J-331X	330 RESISTOR	
	R328	NRSA63J-101X	100 RESISTOR	

■Electrical Parts List (MD Servo P.C.B.)

⚠	Item	Parts Number	Description	Area
	R330	NRSA63J-0R0X	RESISTOR	
	R331	NRSA63J-220X	22 RESISTOR	
	R336	NRSA63J-104X	100K RESISTOR	
	R337	NRSA63J-1R0X	1.0 RESISTOR	
	R338	NRSA63J-4R7X	4.7 RESISTOR	
	R340	NRSA63J-222X	2.2K RESISTOR	
	R341	NRSA63J-222X	2.2K RESISTOR	
	R342	NRSA63J-222X	2.2K RESISTOR	
	R351	NRSA63J-100X	10 RESISTOR	
	R352	NRSA63J-100X	10 RESISTOR	
	R353	NRSA63J-105X	1.0M RESISTDR	
	R354	NRVA63D-103X	10K RESISTOR	
	R355	NRVA63D-103X	10K RESISTOR	
	R361	NRSA63J-102X	1.0K RESISTOR	
	R362	NRSA63J-102X	1.0K RESISTOR	
	R363	NRSA63J-102X	1.0K RESISTOR	
	R364	NRSA63J-102X	1.0K RESISTOR	
	R365	NRSA63J-102X	1.0K RESISTOR	
	R366	NRSA63J-102X	1.0K RESISTOR	
	R367	NRSA63J-102X	1.0K RESISTOR	
	R368	NRSA63J-102X	1.0K RESISTOR	
	R369	NRSA63J-102X	1.0K RESISTDR	
	R370	NRSA63J-104X	100K RESISTOR	
	R371	NRSA63J-103X	10K RESISTOR	
	R372	NRSA63J-103X	10K RESISTOR	
	R375	NRSA63J-103X	10K RESISTOR	
	R376	NRSA63J-104X	100K RESISTOR	
	R377	NRSA63J-684X	680K RESISTOR	
	R378	NRSA63J-332X	3.3K RESISTOR	
	R379	NRSA63J-102X	1.0K RESISTOR	
	R380	NRSA63J-105X	1.0M RESISTOR	
	R381	NRSA63J-102X	1.0K RESISTOR	
	R382	NRSA63J-151X	150 RESISTOR	
	R389	NRSA63J-331X	330 RESISTOR	
	R391	NRSA63J-152X	1.5K RESISTOR	
	R392	NRSA63J-102X	1.0K RESISTOR	
	R393	NRSA63J-102X	1.0K RESISTOR	
	R394	NRSA63J-102X	1.0K RESISTOR	
	R395	NRSA63J-102X	1.0K RESISTOR	
	R396	NRSA63J-331X	330 RESISTOR	
	R397	NRSA63J-331X	330 RESISTOR	
	R401	NRVA63D-123X	12K RESISTOR	
	R402	NRVA63D-512X	5.1K RESISTOR	
	R403	NRSA63J-0R0X	RESISTOR	
	R404	NRSA63J-104X	100K RESISTOR	
	R420	NRVA63D-223X	22K RESISTOR	
	R421	NRVA63D-103X	10K RESISTOR	
	R422	NRVA63D-223X	22K RESISTOR	
	R423	NRVA63D-103X	10K RESISTOR	
	R424	NRVA63D-223X	22K RESISTOR	
	R425	NRVA63D-103X	10K RESISTOR	
	R426	NRVA63D-223X	22K RESISTOR	
	R427	NRVA63D-103X	10K RESISTOR	
	R428	NRVA63D-223X	22K RESISTOR	
	R429	NRVA63D-103X	10K RESISTOR	
	R430	NRVA63D-223X	22K RESISTOR	
	R431	NRVA63D-103X	10K RESISTOR	
	R432	NRVA63D-223X	22K RESISTOR	
	R433	NRVA63D-822X	8.2K RESISTOR	
	R434	NRVA63D-223X	22K RESISTOR	
	R435	NRVA63D-822X	8.2K RESISTOR	
	R436	NRSA63J-223X	22K RESISTOR	
	R437	NRSA63J-302X	3.0K RESISTOR	
	R438	NRSA63J-223X	22K RESISTOR	
	R439	NRSA63J-302X	3.0K RESISTOR	
	R451	NRSA63J-103X	10K RESISTOR	
	R452	NRSA63J-682X	6.8K RESISTOR	
	R453	NRSA63J-1R0X	1.0 RESISTOR	
	R454	NRSA63J-1R0X	1.0 RESISTOR	

⚠	Item	Parts Number	Description	Area
	R455	NRSA63J-223X	22K RESISTOR	
	R481	NRSA63J-100X	10 RESISTOR	
	R483	NRSA63J-0R0X	RESISTOR	
	R485	NRSA63J-103X	10K RESISTOR	
	R491	NRSA63J-471X	470 RESISTOR	
	R492	NRSA63J-471X	470 RESISTOR	
	R495	NRSA63J-471X	470 RESISTOR	
	R496	NRSA63J-471X	470 RESISTOR	
	R501	NRSA63J-105X	1.0M RESISTOR	
	R502	NRSA63J-561X	560 RESISTOR	
	R503	NRSA63J-103X	10K RESISTOR	
	R504	NRSA63J-333X	33K RESISTOR	
	R505	NRSA63J-4R7X	4.7 RESISTOR	
	R510	NRSA63J-102X	1.0K RESISTOR	
	R511	NRSA63J-102X	1.0K RESISTOR	
	R512	NRSA63J-102X	1.0K RESISTOR	
	R513	NRSA63J-102X	1.0K RESISTOR	
	R514	NRSA63J-102X	1.0K RESISTOR	
	R515	NRSA63J-102X	1.0K RESISTOR	
	R516	NRSA63J-102X	1.0K RESISTOR	
	R517	NRSA63J-104X	100K RESISTOR	
	R518	NRSA63J-102X	1.0K RESISTOR	
	R519	NRSA63J-102X	1.0K RESISTOR	
	R520	NRSA63J-102X	1.0K RESISTOR	
	R521	NRSA63J-102X	1.0K RESISTOR	
	R522	NRSA63J-222X	1.0K RESISTOR	
	R523	NRSA63J-102X	1.0K RESISTOR	
	R524	NRSA63J-102X	1.0K RESISTOR	
	R525	NRSA63J-102X	1.0K RESISTOR	
	R531	NRSA63J-103X	10K RESISTOR	
	R532	NRSA63J-103X	10K RESISTOR	
	R533	NRSA63J-103X	10K RESISTOR	
	R534	NRSA63J-103X	10K RESISTOR	
	R535	NRSA63J-103X	10K RESISTOR	
	R549	NRSA63J-0R0X	RESISTOR	
	R551	NRSA63J-104X	100K RESISTOR	
	R552	NRSA63J-104X	100K RESISTOR	
	R553	NRSA63J-104X	100K RESISTOR	
	R554	NRSA63J-104X	100K RESISTOR	
	R555	NRSA63J-102X	1.0K RESISTOR	
	R556	NRSA63J-102X	1.0K RESISTOR	
	R557	NRSA63J-102X	1.0K RESISTOR	
	R558	NRSA63J-102X	1.0K RESISTOR	
	R559	NRSA63J-333X	33K RESISTOR	
	R560	NRSA63J-333X	33K RESISTOR	
	R561	NRSA63J-333X	33K RESISTOR	
	R562	NRSA63J-333X	33K RESISTOR	
	R563	NRSA63J-333X	33K RESISTOR	
	R591	NRSA63J-220X	22 RESISTOR	
	R592	NRSA63J-104X	100K RESISTOR	
		OTHERS		
	K391	NQR0265-003X	BANDPASS FILTER	
	K491	NQR0129-004X	BANDPASS FILTER	
	K492	NQR0129-004X	BANDPASS FILTER	
	K495	NQR0129-004X	BANDPASS FILTER	
	K496	NQR0129-004X	BANDPASS FILTER	
	K521	NQR0155-002X	INDUCTOR	
	K522	NQR0155-002X	INDUCTOR	
	K523	NQR0129-002X	BANDPASS FILTER	
	K524	NRSA63J-0R0X	RESISTOR	
	L525	NQL114M-1R0X	INDUCTOR	
	L526	NQL114M-1R0X	INDUCTOR	
	X350	NAX0160-001X	CRYSTAL	
	X500	NAX0159-001X	CRYSTAL	
	CN321	QGF0501F2-21X	CONNECTOR	
	CN407	QGA2001F2-07X	SOCKET	
	CN408	QGA2001F2-08X	SOCKET	
	CN521	QGF1006F2-21W	SOCKET	

■Electrical Parts List (MD Loading P.C.B.)

⚠	Item	Parts Number	Description	Area
		OTHERS		
	S003	QSW0472-001	SWITCH	
	CN002	EWS267-F908	SKT WIRE ASSY	

■Electrical Parts List (MD Switch P.C.B.)

⚠	Item	Parts Number	Description	Area
		OTHERS		
	S001	QSW0104-001	SWITCH	
	CN001	EWS268-F911	SKT WIRE ASSY	

■Packing Parts List

Block No. M3MM

⚠	Item	Parts Number	Parts Name	Q'ty	Description	Area
	P1	LV20149-002A	PACKING CASE	1		
	P2	LV20150-001A	PACKING CUSHION	1		
	P3	LV20151-001A	PACKING CUSHION	1		
	P4	QPC06506515P	POLY BAG	1		
	P5	LV30631-001A	PACKING SHEET	1		
	P6	QPC02503510P	POLY BAG	2		

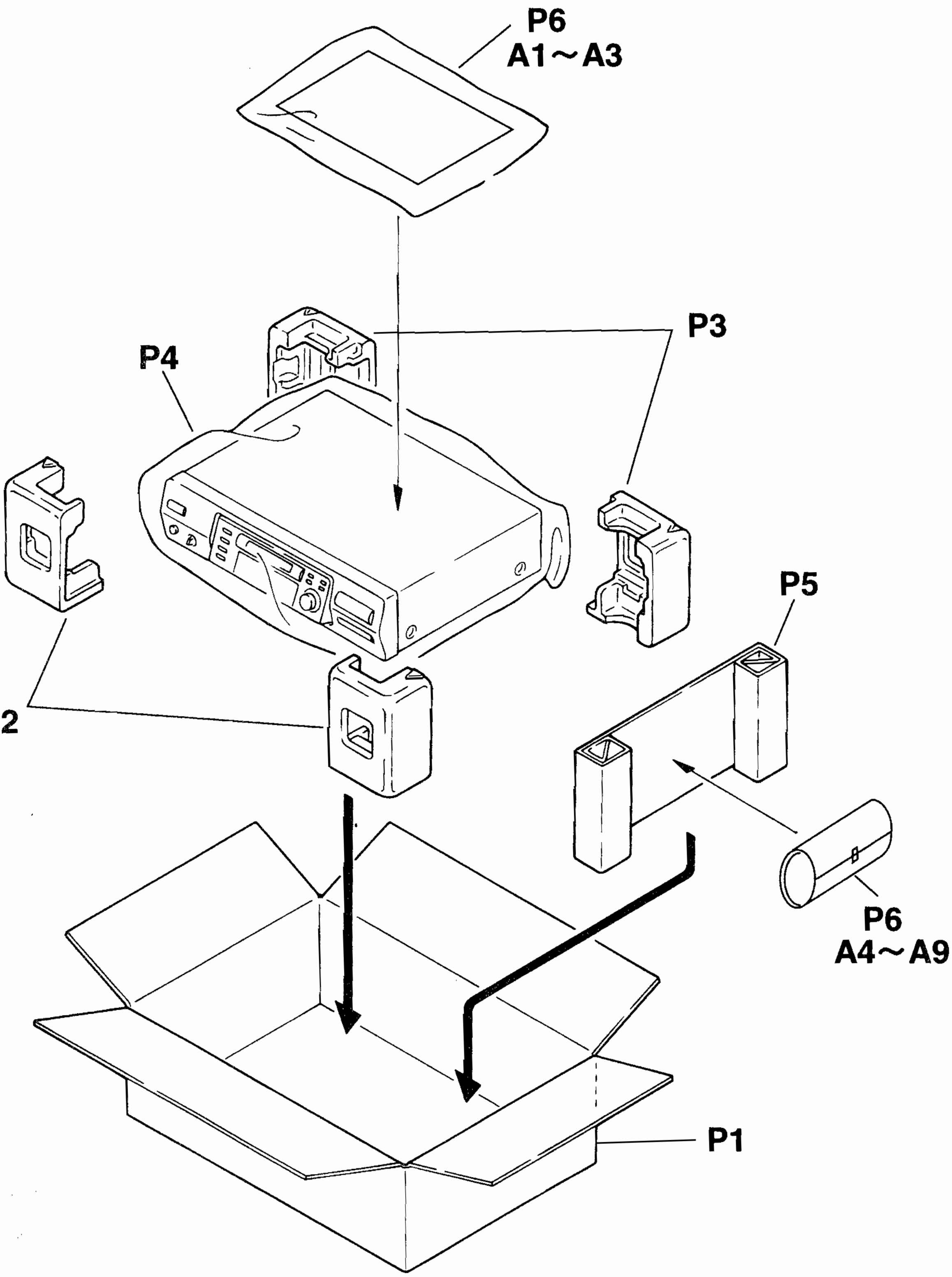
■Accessories Parts List

Block No. M4MM

⚠	Item	Parts Number	Parts Name	Q'ty	Description	Area
	A1	LVT0111-001B	INSTRUCTION BOOK	1	ENG, GER, FRE, DUT, SPA, ITA	E
		LVT0111-002B	INSTRUCTION BOOK	1	GER, FER, DUT, SWE, FIN, DAN	EN
		LVT0111-003B	INSTRUCTION BOOK	1	ENG	B
	A2	E43486-340B	SAFETY SHEET	1		B
	A3	BT-54008-1	WARRANTY CARD	1		
	A4	EWP302-023	SIGNAL CORD	2		
	A5	EWP805-012	PLUG WIRE ASSY	1		
	A6	QAM0006-001	OPTICAL SIGNAL CORD ASSY	1		
⚠	A7	QMP39F0-183	POWER CORD	1		E, EN
⚠		QMP5520-183	POWER CORD	1		B
	A8	RM-SM228EU	WIRE-LESS REMOTE CONTROL	1		
	A9	---------------	BATTERY	1		

Packing Materials and Accessories Parts List

Block No. M 3 M M
Block No. M 4 M M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(No.20721)

Printed in Japar
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